Guidebook for IROPS Stakeholder Communication & Coordination

DETAILS

234 pages | 8.5 x 11 | PAPERBACK
ISBN 978-0-309-37534-4 | DOI 10.17226/23489

AUTHORS

þÿBarbara Cogliandro; Rafal Kicinger; Ed Masterson; Giles O Keeffe; Rose Agnew; J. Michael Nash; Christina Coverdell; Tim Anderson; Richard Marchi; Justin Phy; and Tim Callister

AIRPORT COOPERATIVE RESEARCH PROGRAM

ACRP REPORT 153

Guidebook for IROPS Stakeholder Communication & Coordination

Barbara Cogliandro
Rafal Kicinger
Ed Masterson
Giles O'Keeffe
METRON AVIATION, INC.
Washington, DC

Rose Agnew
J. Michael Nash
Christina Coverdell
AVIATION INNOVATION, LLC
St. Paul, MN

Tim Anderson
ANDERSON CONSULTING, LLC
Eden Prairie, MN

Richard Marchi
RFMARCHI AVIATION CONSULTING, INC.
Washington, DC

Justin Phy
BARICH, INC.
Richmond, TX

Tim Callister
MEAD & HUNT, INC.
Minneapolis, MN

Subscriber Categories
Aviation • Operations and Traffic Management • Safety and Human Factors

Research sponsored by the Federal Aviation Administration

TRANSPORTATION RESEARCH BOARD

WASHINGTON, D.C.
2016
www.TRB.org

AIRPORT COOPERATIVE RESEARCH PROGRAM

Airports are vital national resources. They serve a key role in transportation of people and goods and in regional, national, and international commerce. They are where the nation's aviation system connects with other modes of transportation and where federal responsibility for managing and regulating air traffic operations intersects with the role of state and local governments that own and operate most airports. Research is necessary to solve common operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the airport industry. The Airport Cooperative Research Program (ACRP) serves as one of the principal means by which the airport industry can develop innovative near-term solutions to meet demands placed on it.

The need for ACRP was identified in *TRB Special Report 272: Airport Research Needs: Cooperative Solutions* in 2003, based on a study sponsored by the Federal Aviation Administration (FAA). ACRP carries out applied research on problems that are shared by airport operating agencies and not being adequately addressed by existing federal research programs. ACRP is modeled after the successful National Cooperative Highway Research Program (NCHRP) and Transit Cooperative Research Program (TCRP). ACRP undertakes research and other technical activities in various airport subject areas, including design, construction, legal, maintenance, operations, safety, policy, planning, human resources, and administration. ACRP provides a forum where airport operators can cooperatively address common operational problems.

ACRP was authorized in December 2003 as part of the Vision 100—Century of Aviation Reauthorization Act. The primary participants in the ACRP are (1) an independent governing board, the ACRP Oversight Committee (AOC), appointed by the Secretary of the U.S. Department of Transportation with representation from airport operating agencies, other stakeholders, and relevant industry organizations such as the Airports Council International-North America (ACI-NA), the American Association of Airport Executives (AAAE), the National Association of State Aviation Officials (NASAO), Airlines for America (A4A), and the Airport Consultants Council (ACC) as vital links to the airport community; (2) TRB as program manager and secretariat for the governing board; and (3) the FAA as program sponsor. In October 2005, the FAA executed a contract with the National Academy of Sciences formally initiating the program.

ACRP benefits from the cooperation and participation of airport professionals, air carriers, shippers, state and local government officials, equipment and service suppliers, other airport users, and research organizations. Each of these participants has different interests and responsibilities, and each is an integral part of this cooperative research effort.

Research problem statements for ACRP are solicited periodically but may be submitted to TRB by anyone at any time. It is the responsibility of the AOC to formulate the research program by identifying the highest priority projects and defining funding levels and expected products.

Once selected, each ACRP project is assigned to an expert panel appointed by TRB. Panels include experienced practitioners and research specialists; heavy emphasis is placed on including airport professionals, the intended users of the research products. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, ACRP project panels serve voluntarily without compensation.

Primary emphasis is placed on disseminating ACRP results to the intended users of the research: airport operating agencies, service providers, and academic institutions. ACRP produces a series of research reports for use by airport operators, local agencies, the FAA, and other interested parties; industry associations may arrange for workshops, training aids, field visits, webinars, and other activities to ensure that results are implemented by airport industry practitioners.

ACRP REPORT 153

Project 10-23
ISSN 1935-9802
ISBN 978-0-309-37534-4
Library of Congress Control Number 2016936107

COPYRIGHT INFORMATION

NOTICE

The report was reviewed by the technical panel and accepted for publication according to procedures established and overseen by the Transportation Research Board and approved by the National Academies of Sciences, Engineering, and Medicine.

The opinions and conclusions expressed or implied in this report are those of the researchers who performed the research and are not necessarily those of the Transportation Research Board; the National Academies of Sciences, Engineering, and Medicine; or the program sponsors.

The Transportation Research Board; the National Academies of Sciences, Engineering, and Medicine; and the sponsors of the Airport Cooperative Research Program do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the object of the report.

Published reports of the

AIRPORT COOPERATIVE RESEARCH PROGRAM

are available from

Transportation Research Board
Business Office
500 Fifth Street, NW
Washington, DC 20001

and can be ordered through the Internet by going to

http://www.national-academies.org

and then searching for TRB

Printed in the United States of America

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

The **National Academy of Sciences** was established in 1863 by an Act of Congress, signed by President Lincoln, as a private, non-governmental institution to advise the nation on issues related to science and technology. Members are elected by their peers for outstanding contributions to research. Dr. Ralph J. Cicerone is president.

The **National Academy of Engineering** was established in 1964 under the charter of the National Academy of Sciences to bring the practices of engineering to advising the nation. Members are elected by their peers for extraordinary contributions to engineering. Dr. C. D. Mote, Jr., is president.

The **National Academy of Medicine** (formerly the Institute of Medicine) was established in 1970 under the charter of the National Academy of Sciences to advise the nation on medical and health issues. Members are elected by their peers for distinguished contributions to medicine and health. Dr. Victor J. Dzau is president.

The three Academies work together as the **National Academies of Sciences, Engineering, and Medicine** to provide independent, objective analysis and advice to the nation and conduct other activities to solve complex problems and inform public policy decisions. The Academies also encourage education and research, recognize outstanding contributions to knowledge, and increase public understanding in matters of science, engineering, and medicine.

Learn more about the National Academies of Sciences, Engineering, and Medicine at **www.national-academies.org**.

The **Transportation Research Board** is one of seven major programs of the National Academies of Sciences, Engineering, and Medicine. The mission of the Transportation Research Board is to increase the benefits that transportation contributes to society by providing leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied committees, task forces, and panels annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.

Learn more about the Transportation Research Board at **www.TRB.org**.

COOPERATIVE RESEARCH PROGRAMS

CRP STAFF FOR ACRP REPORT 153

Christopher W. Jenks, *Director, Cooperative Research Programs*
Michael R. Salamone, *ACRP Manager*
Theresia H. Schatz, *Senior Program Officer*
Terri Baker, *Senior Program Assistant*
Eileen P. Delaney, *Director of Publications*
Sharon Lamberton, *Editor*

ACRP PROJECT 10-23 PANEL
Field of Operations

Brad Martin, *Massport Authority, East Boston, MA* (Chair)
Kenneth Brammer, *Delta Airport Consultants, Inc., Richmond, VA*
Joanne M. Landry, *Landry Consultants LLC, Seattle, WA*
Lisa J. LeBlanc-Hutchings, *Lee County Port Authority, Fort Myers, FL*
Panagiota P. "Penny" Neferis Giarretto, *JetBlue Airways, Long Island City, NY*
Dianne L. Walker, *Wayne County Airport Authority, Romulus, MI* (Retired)
Lillian Miller, *FAA Liaison*
Paul James Eubanks, *Airports Council International—North America Liaison*

AUTHOR ACKNOWLEDGMENTS

The authors wish to express appreciation to the various airport staff who were interviewed as part of this study. Airport staff provided information concerning the best practices and lessons learned from managing complex irregular operations events in the recent past. Those interviewed included representatives from the following airports:

- Hartsfield–Jackson Atlanta International Airport, Georgia
- Denver International Airport, Colorado
- Duluth International Airport, Minnesota
- Heathrow Airport, London, England
- General Mitchell International Airport, Milwaukee, Wisconsin
- Minneapolis–St. Paul International Airport, Minnesota
- Toronto Pearson International Airport, Toronto, Canada
- Portland International Airport, Oregon

FOREWORD

By Theresia S. Schatz
Staff Officer
Transportation Research Board

ACRP Report 153: Guidebook for IROPS Stakeholder Communication & Coordination provides details on strategies and tools for reducing IROPs impacts on passengers. This guidebook will assist communication and coordination as airports and airlines implement IROPS contingency plans. Included are communication checklists and a strategy for obtaining and maintaining stakeholder contacts; a list of federal flight data resources and other technologies, which allow for expedited communication regarding diversions on a national, regional, and local scale; flow diagrams to illustrate the integration of communication and collaboration processes; case studies of a variety of scenarios depicting IROPS responses; scenarios and instructions for conducting tabletop exercises; and a tool to assist in predicting the risks associated with national, regional, and local IROPS events to improve planning and response. This CD-based tool includes a response plan for stakeholders' involvement in assessing the likelihood and severity of reoccurrence of IROPS impacts, data sources to help alert an airport when an IROPS event is likely to occur, and the ability to create reports on IROPS risk levels for the stakeholders. The case studies and tabletop exercises also serve as training materials and can be customized for any airport.

Process recommendations for airports to coordinate their IROPS contingency plans with airlines were developed as part of the recent *ACRP Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning.* Follow-up regional discussions hosted by the U.S.DOT, FAA, and ACRP have helped many airports in coordinating contingency plans with other stakeholders. While certificated airports and airlines have filed their Tarmac Delay Contingency Plans with the U.S.DOT, many of these plans could be better coordinated between the stakeholders and the airports. Better communication and collaboration is necessary to prevent, or to respond to, events that lead to delays and unwanted impacts to the traveling public. This guidance has been developed to help provide more timely communication and coordinated planning among stakeholders for cooperative responses to IROPS events.

Under ACRP Project 10-23, research was conducted by Metron Aviation in association with Aviation Innovation, LLC; Anderson Consulting, LLC; RFMarchi Aviation Consulting, Inc.; Barich, Inc.; and Mead & Hunt, Inc. A series of interviews were conducted with airport stakeholders from numerous airports to gather information about airport and airline experiences responding to IROPS. Electronic files, available on CRP-CD-180, include the IROPS Risk Assessment Tool and User's Guide, Tabletop Exercises, Tools for IROPS Stakeholder Communication & Coordination, as well as IROPS resources from *ACRP Report 65* bound into this report and also available at www.trb.org.

CONTENTS

Note: Photographs, figures, and tables in this report may have been converted from color to grayscale for printing. The electronic version of the report (posted on the web at www.trb.org) retains the color versions.

PART 1

Guidebook

SECTION 1

Why Is this Guidebook Needed?

1.1 Introduction

In 2006, a passengers' rights movement drew attention to the need for improved aviation industry communication and planning to meet passenger needs during irregular operations (IROPS). In response, the U.S.DOT began issuing rules and regulations that, among other things, required airlines to coordinate IROPS plans with airports to improve the passenger experience (**Figure 1**). Simultaneously, collaborative-focused guidance materials, including *ACRP Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning*, were published to provide tools and best practices for airports to use to improve cooperation with airlines and government agencies during irregular conditions.

Follow-up discussions related to the desire for coordinated airport and airline response to flight diversion IROPS events occurred at six forums: one DOT/FAA Diversion Forum held in late 2011 and five FAA Diversion Forums held in early 2012. Additional discussions took place in 2012 at eight *ACRP Report 65* dissemination workshops. These workshops, held around the nation, drew 480 attendees that included representatives from 95 airports (90% of all major hub airports) and 21 airlines. The forums and workshops revealed that, although airlines and airports have technically complied with U.S.DOT's 2011 "Enhancing Airline Passenger Protections" ruling and the FAA Modernization and Reform Act of 2012 by filing their tarmac delay contingency plans, many of these plans fall short of meeting the intent of the ruling, which is to open communication lines and establish cooperative actions between aviation stakeholders during IROPS events.

Feedback from the *ACRP Report 65* dissemination workshops identified the need for aviation stakeholders to:

- Establish and maintain up-to-date 24/7 contact information for all organizations involved in IROPS response, including alternates;
- Improve IROPS notification procedures to enable stakeholders to anticipate needs;
- Develop methods for communicating real-time shared situational awareness, especially between airports and airlines;
- Achieve more coordination and communication among stakeholders during after-hour diversions;
- Develop procedures, such as training sessions, to communicate ideas from debriefing sessions to all stakeholders;
- Use social media as a communication tool among stakeholders;
- Hold regular region-wide communication briefings for stakeholders;
- Develop procedures to share resources and equipment among stakeholders; and
- Share federal and aviation information resources to assist with IROPS communication among stakeholders.

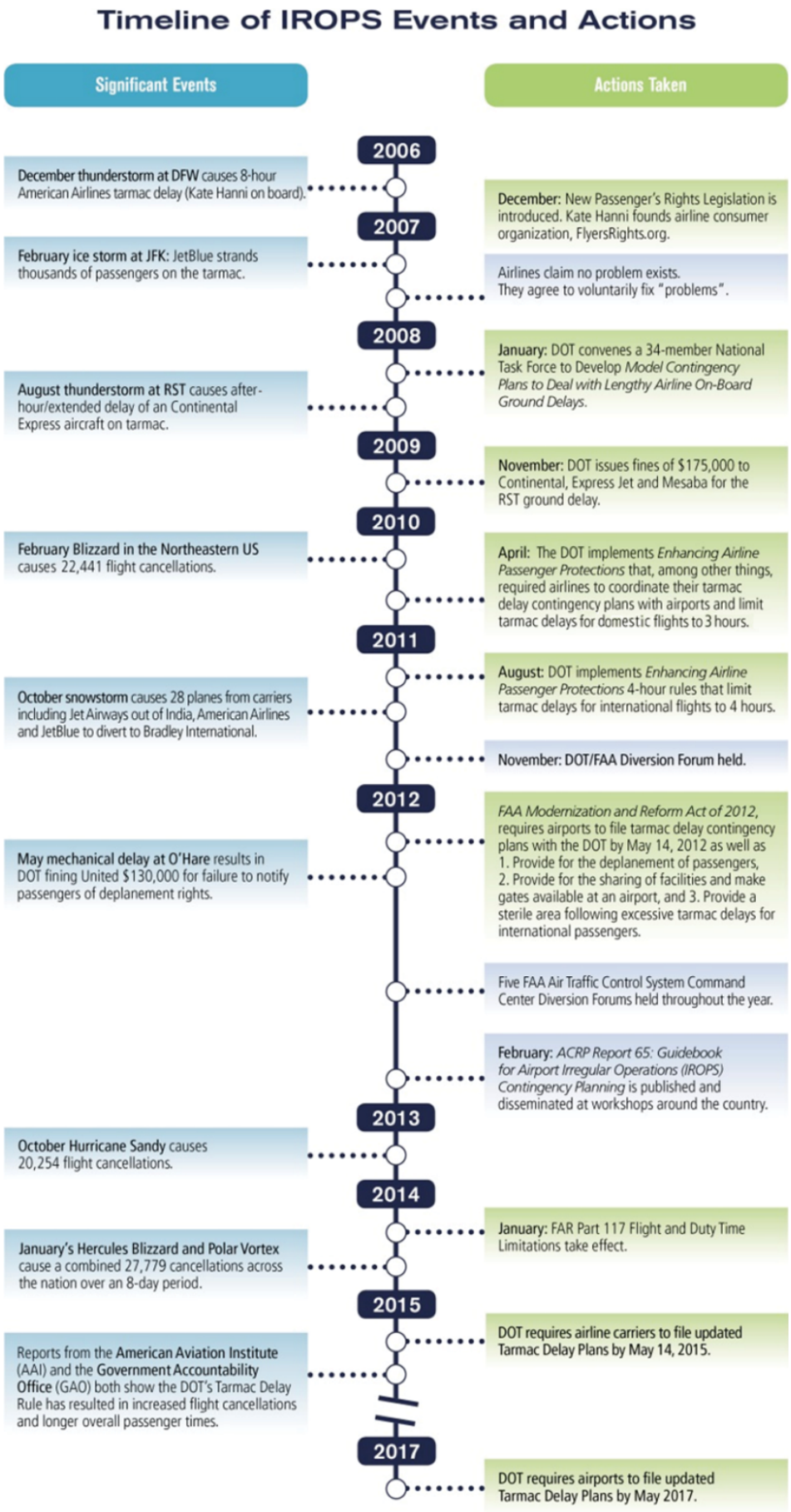


Figure 1. Timeline of IROPS events and actions.

Today, many airports have begun to address some of these recommendations by establishing IROPS plans in addition to their filed tarmac delay contingency plans. These plans range from formal, complex plans to informal, ad hoc plans that combine everything from operating procedures from various other plans to verbal "handshake" agreements. However, most of these airports' plans—no matter how formal or informal—have been developed as self-contained contingency plans designed to be implemented independently of other aviation stakeholders during IROPS events. This reflects a larger industry-wide problem of many aviation organizations operating in silos, revealing a lack of coordinated efforts, especially during diversion and extended-delay situations.

During diversion events, many reliever airports report that they still have limited coordination with airlines that only irregularly use them for diverted flights. Other airport authorities report that they receive minimal notice, if any, of diversion aircraft headed to their respective airports, and therefore they often do not have adequate staffing available at the time of the diversions to accommodate the aircraft or its passengers. This situation is particularly challenging when diversions occur beyond an airport's regular hours of operation. This lack of coordination has been further identified by the issuance of several U.S.DOT aviation enforcement orders during the past few years that demonstrate how air carrier contingency plans have not been fully coordinated with all scheduled and diversion airports or with other agencies, like U.S. Customs and Border Protection (CBP), and organizations such as Fixed-Base Operators (FBOs).

During extended disruptive events, airports that primarily use ad hoc or loosely formed IROPS agreements have discovered that their plans, which tend to be adequate for managing recurring IROPS events like seasonal weather situations, are inadequate when new situations occur or when events turn into extended-delay situations. New or extenuating circumstances often can reveal:

- Gaps in stakeholder participation that result from omitting a needed stakeholder or an inability to reach a certain stakeholder because contact information is inaccurate and/or because alternate contacts have not been identified;
- Lack of contingency plans for equipment malfunctions that can occur during long-term events involving extreme temperatures;
- Inadequate manual processes in place to maintain business continuity after loss of a technology-dependent service;
- No clear guidance on which stakeholder is responsible for IROPS-related expenditures;
- Lack of understanding related to each airport's terminal and/or gate capacity constraints in a region;
- Lack of a fully coordinated public/passenger communication plan using various technologies, including social media; and/or
- No clear directions on how stakeholders should manage an escalating situation.

Compounding all of these challenges is, at the core, a trust issue between and among stakeholders in the aviation industry. Trust needs to be built among various stakeholders in order for different organizations to work effectively with one another. This guidebook is designed to provide strategies and tools to assist airports as they develop trust with their aviation stakeholders and discover ways to improve coordination and work collaboratively to mitigate IROPS events.

Better communication, collaboration, and cooperation in the aviation industry are necessary to prevent and to respond to events that lead to delays and unwanted impacts to the traveling public. Guidance is needed for more timely communication and coordinated planning among stakeholders for cooperative responses to IROPS events.

1.2 Expected Results from this Guidebook

Airports of various sizes can use this guidebook to help:

- Refine their IROPS response planning to specifically meet U.S.DOT and FAA regulations by linking guidance to specific U.S.DOT Airport Tarmac Delay Contingency Plan requirements that involve the coordination of stakeholders;
- Protect their public image by being better prepared to respond to IROPS events in a collaborative manner with other stakeholders in the industry; and
- Establish or improve cooperation, communication, and coordination with airlines and other organizations involved in IROPS response planning by using the IROPS Risk Assessment Tool collectively to prioritize investments of time, responsibility, and capital needed for effective response.

Specifically, the guidance presented can help airports comply with the following DOT requirements:

- Provide local IROPS contingency plans (required since May 14, 2012) and update them regularly according to U.S.DOT's 5-year cycle;
- Provide for deplanement of passengers following excessive tarmac delays;
- Provide for sharing of gates and other facilities; and
- Provide a sterile area, in the event of excessive tarmac delays, for passengers who have not yet cleared U.S. Customs and Border Protection (CBP) screening.

This guidebook also provides strategies and tools for airports to use to engage with other stakeholders to meet the intent of U.S.DOT rules that require stakeholders to coordinate with one another. Although the U.S.DOT requirements are for domestic and international airline carriers, airports are involved as follows:

- Airlines must provide assurance that plans have been coordinated with airport authorities and with each airport that the carrier serves, including:
  - Diversion airports,
  - Large hub airports,
  - Medium hub airports,
  - Small hub airports, and
  - Non-hub primary airports.
- **Part 1—Appendix A.2** provides more details.

1.3 Who Can Use the Guidebook

This guidebook is applicable to airports of all sizes, including small, medium, large hub, and non-hub airports. FAA's Categories of Airport Activities defines airport size as follows:

- **Non-hub primary:** airports handling over 10,000 but less than 0.05% of the country's annual passenger boardings;
- **Small hub:** airports with 0.05% to 0.25% of the country's annual passenger boardings;
- **Medium hub:** airports handling 0.25% to 1% of the country's annual passenger boardings; and
- **Large hub:** airports handling over 1% of the country's annual passenger boardings.

This guidebook is intended for airports to use with stakeholders within an airport's geographic region in order to achieve optimal stakeholder coordination. Such coordination is particularly important when IROPS events cause aircraft diversions that can affect multiple airports in a particular region.

Airports of all sizes are encouraged to use the guidance presented in *ACRP Report 153* to augment their current IROPS planning efforts. The guidebook is organized in a progressive format, as follows:

Part 1 begins with this introductory section, which orients readers to the background of ACRP Project 10-23 and the various components of the IROPS planning process.

Section 2 provides an overview of the original six-step IROPS planning process and a discussion of how the ACRP Project 10-23 research expands on that foundation.

Section 3 presents a "Quick Guide" to the expanded procedure, collaborative recommendations and checklists, and the IROPS Risk Assessment Tool. The Quick Guide has been streamlined intentionally to provide practical recommendations for airports that can use high-level, easy-to-incorporate advice. For readers who desire more in-depth information, the Quick Guide includes specific references to additional content provided elsewhere with the guidebook.

Section 4 summarizes the key questions and concepts involved in improving stakeholder coordination and communication before, during, and after an IROPS event.

Appendices A, B, and **C** in Part 1 of this guidebook provide more in-depth information about the process, documents, and tools introduced in Sections 3 and 4. The appendices also present sample scenarios, case studies, checklists, tools, documents, and templates.

Part 2 of this guidebook presents the complete IROPS Risk Assessment Tool User's Guide.

Also in Part 2, **Appendices A through E** of the User's Guide provide additional, concise information on data sources, types of IROPS events and impacts, a Quick Reference Guide, minimum system and file requirements for running the IROPS Risk Assessment Tool, and special instructions for users of Microsoft Excel 2013.

CRP-CD 180, found at the back of this guidebook, provides full-blown editable tools and training documents, and additional reference material (see **Figure 2**). The CD-ROM contains:

- An electronic copy of the complete IROPS Risk Assessment Tool User's Guide;
- The IROPS Risk Assessment Tool, which has been designed to be as simple or complex as an airport requires using separate stakeholder files presented in Microsoft Excel;
- An electronic copy of the detailed IROPS Tabletop Exercise Planning Guide, which coordinates with material in **Part 1—Appendix A.9** of the guidebook;
- Detailed tabletop exercise planning scenarios that can be used "as is" for training or easily tailored into exercises that reflect an airport's unique conditions;
- Tools for stakeholder communication and coordination, also presented as editable Microsoft Word files for customization by airports; and
- IROPS resources reproduced from *ACRP Report 65*—Part 2, which makes available topics and tools referenced in **Part 1—Appendix A.1** of this guidebook.

This guidebook generally uses the term "regional airports" to describe airports that are geographically associated with a hub airport for coordinated planning. However, the term "diversion airports" also is used. "Diversion airports" is a term used by U.S.DOT to describe the airports that airlines have defined in their internal plans as those with which they must coordinate their tarmac delay contingency plans.

1.4 How to Get Started

To gain the most value from the guidance presented in *ACRP Report 153*, it is important that readers have a baseline understanding of IROPS planning. To that end, this guidebook is most beneficial if readers:

- Understand how IROPS events are managed at their airport (e.g., whether they use a comprehensive IROPS Plan, elements of an IROPS Plan, or link various associated plans to manage IROPS events); and
- Familiarize themselves with previously published IROPS guidance material.

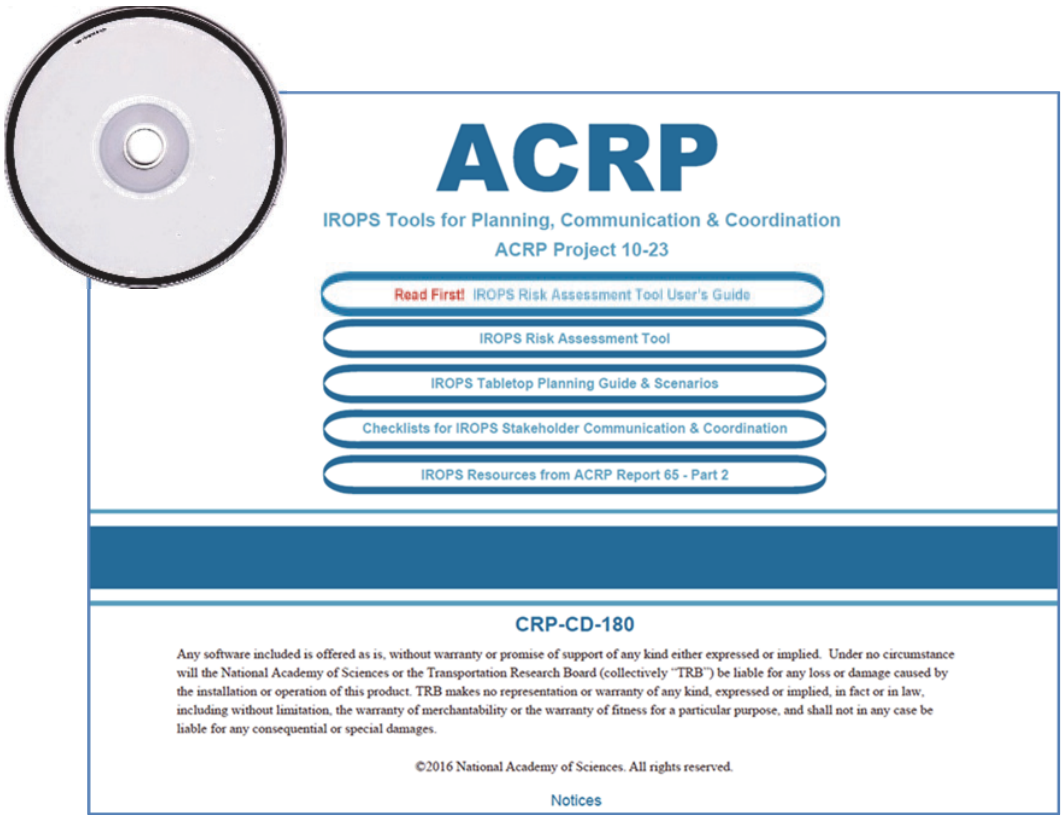


Figure 2. CRP-CD 180 includes the IROPS Risk Assessment Tool, the associated User's Guide, the IROPS Tabletop Exercise Planning Guide with eight tabletop narratives and editable worksheets, editable copies of the tools for IROPS Stakeholder communication and coordination, and reference files containing resources first published in* ACRP Report 65*—Part 2.

Essentially, the guidance provided in *ACRP Report 153* follows on and expands that presented in *ACRP Report 65*, published in February 2012. For readers' convenience, introductory information from *ACRP Report 65* has been edited to coordinate with this updated guidance and is reproduced as **Part 1—Appendix A.1.** This guidebook does not reprint the resource files from Part 2 of *ACRP Report 65*; however, they are available on the accompanying **CRP-CD 180,** and readers who wish to consult the original *ACRP Report 65* can access a downloadable PDF of that report at http://www.trb.org.

After completing a quick refresher of baseline IROPS planning, it is recommended that readers approach the guidance presented in *ACRP Report 153* as follows:

1. Begin with **Part 1—Section 2** of this guidebook, which briefly explains how this guidance builds from and expands upon previous research in collaborative IROPS mitigation techniques.
2. Next, read the Quick Guide (**Part 1—Section 3**) overview of the tools, checklists, training, and additional guidance provided in the accompanying appendices and **CRP-CD 180.** These documents and tools will assist airports with identifying stakeholder communication gaps—and techniques for addressing these gaps—to improve collaborative IROPS plans and procedures.
3. Become familiar with all the sections in **Appendices A, B,** and **C** in Part 1 of this guidebook. These documents address tools and resources to use before, during, and after an IROPS event, and introduce tabletop exercise scenarios and planning tools useful to airports.

4. Review the contents of **CRP-CD 180,** which accompanies this guidebook. For readers' convenience, the User's Guide for the IROPS Risk Assessment Tool is provided both electronically on the CD-ROM and printed as Part 2 of this guidebook.

The IROPS Risk Assessment Tool can help airports and all stakeholders identify what resources are available at the airport and the best way to use them, enhance communication among stakeholders, identify airport shortfalls in mitigating impacts from IROPS, and highlight the necessary decisions for improving IROPS response plans. Along with airports, airlines and other organizations involved in IROPS response planning can be encouraged to consider using the IROPS Risk Assessment Tool. As explained in its associated User's Guide, the IROPS Risk Assessment Tool works best when local IROPS leaders have been identified in specific roles in order to conduct risk assessments on a regular basis and maintain up-to-date files.

SECTION 2

Building and Expanding on the IROPS Roadmap and Principles

As mentioned in **Section 1,** this guidebook has been developed as an enhancement to *ACRP Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning.* Readers are urged to review the basic IROPS principles described in *ACRP Report 65* to provide background for the enhancements described in this guidebook.

The recommendations of this guidebook support the six-step process initially described in *ACRP Report 65*—Part 1 (see **Part 1—Appendix A.1**).

2.1 Original Six-Step IROPS Planning Process

Figure 3 illustrates the six-step IROPS planning process that was developed to provide a structured approach to help airports achieve cooperation and collaboration during IROPS events.

2.2 Expanded IROPS Planning Process

This guidebook directly expands upon *ACRP Report 65* guidance and subsequent U.S.DOT/FAA forums and research from ACRP Project 10-23. Each of the original six steps has been expanded to include a subset, as indicated in **Figure 4**.

Section 3 of this guidebook presents a high-level, Quick Guide discussion of each subset in this expanded planning process.

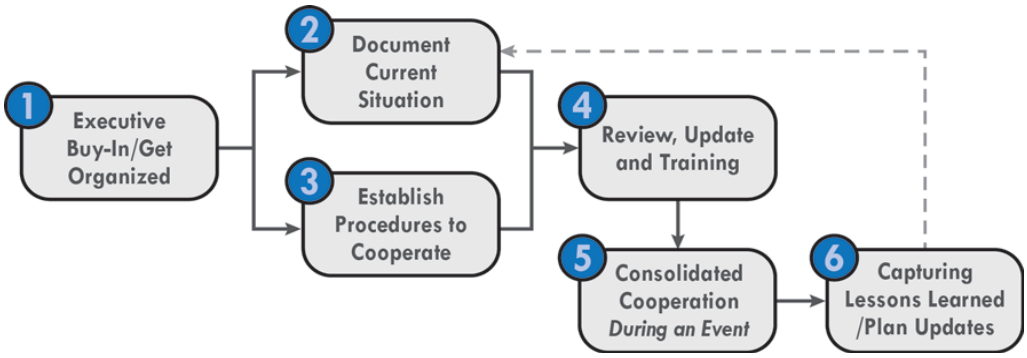


Figure 3. The six-step IROPS planning process (ACRP Report 65).

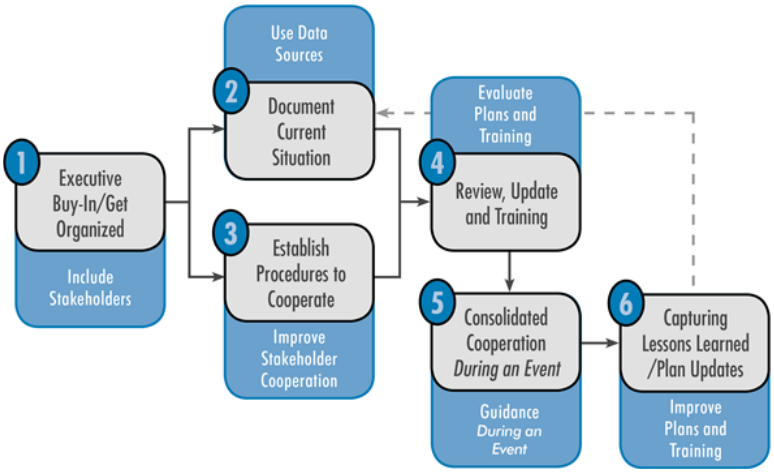


Figure 4. Expanded six-step IROPS planning process.

SECTION 3

Quick Guide for Enhancing the IROPS Planning Process

How has the IROPS planning process been expanded?

This section directly expands on the original six-step IROPS planning process from *ACRP Report 65* by incorporating the subsets and subsections shown in **Figure 5.**

Each subsection expands upon the original six-step IROPS planning process described in *ACRP Report 65* as follows:

- **Step 1, Executive Buy-In/Get Organized** has been expanded with the subset **3.1 Include Stakeholders**, which incorporates the subsections **Stakeholder Checklists** and **Maintaining Stakeholder Contacts.** Using an expanded list of stakeholder groups ensures that airports include all relevant representatives in their IROPS planning process.
- **Step 2, Document Current Situation,** has been expanded with the subset **3.2 Use Data Sources**, which incorporates the subsections **Federal Flight Data Resources** and **Other Flight Data Resources.** As expanded, this step highlights the various types of flight and weather-related data available for airports to create situational awareness among stakeholders during events or assess past performance collaborating with stakeholders.
- **Step 3, Establish Procedures to Cooperate,** has been expanded with the subset **3.3 Improve Stakeholder Cooperation**, which incorporates the subsection **Communications and Collaboration Planning.** As expanded, this step reviews the interconnectedness of stakeholders, details the types of communications suggested for improved performance among stakeholders, and includes an annual checklist to keep stakeholders engaged with one another.
- **Step 4, Review, Update, and Training,** has been expanded with the subset **3.4 Evaluate Plans and Training**, which incorporates the subsections **Case Studies, Tabletop Exercises,** and **Risk Assessment Tool.** This expanded step now includes descriptive case studies and U.S.DOT aviation enforcement order summaries, tabletop exercises, and the IROPS Risk Assessment Tool developed as part of this guidance.
- **Step 5, Consolidated Cooperation *During an Event,*** has been expanded with the subset **3.5 Guidance During an Event**, which incorporates the subsection **Shared Situational Awareness.** As expanded, this step provides communication and coordination checklists—including an IROPS readiness checklist—to ensure shared responsibility among stakeholders, and a social media checklist to improve shared situational awareness among stakeholders during IROPS events.
- **Step 6, Capturing Lessons Learned/Plan Updates,** has been expanded with the subset **3.6 Improve Plans and Training**, which incorporates the subsections **Lessons Learned, Updating Plans,** and **Updating Training.** As expanded, this step includes procedures to use during recovery efforts, identifies assessment areas to be evaluated in debriefing sessions, and includes an accountability checklist to ensure IROPS plans and training are updated as needed.

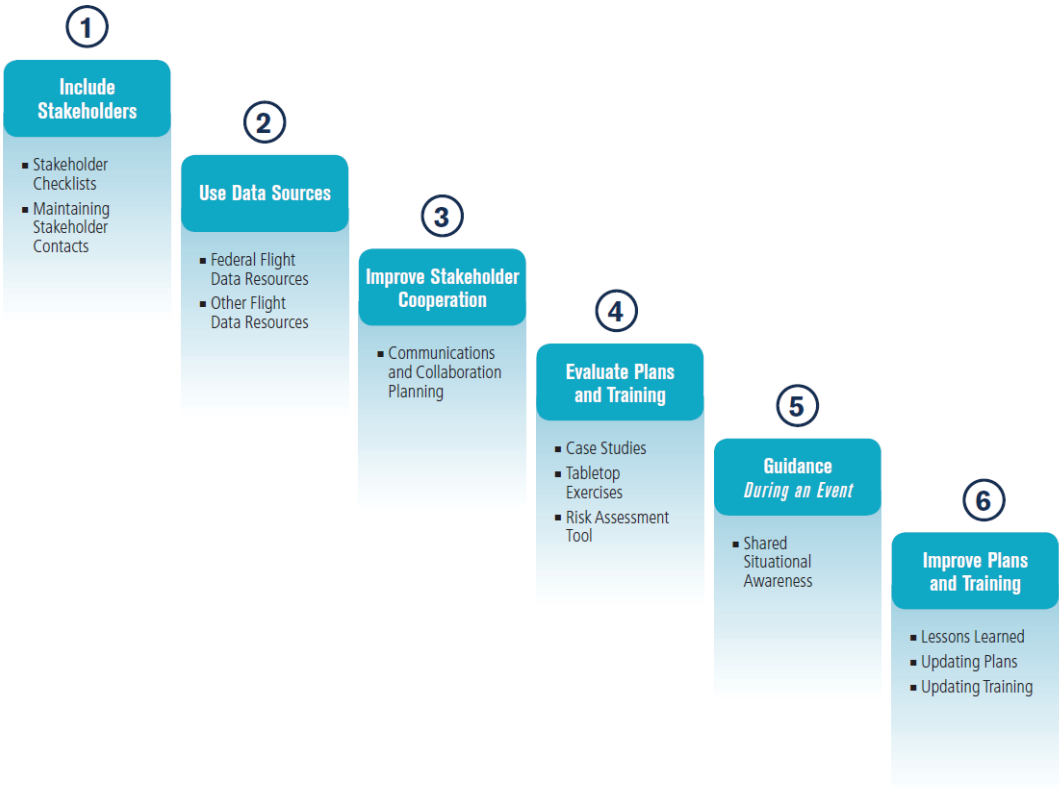


Figure 5. Details of the expanded six-step IROPS planning process.

The remaining parts of this section provide further explanation about the new subsets and subsections that expand the six-step process.

3.1 Include Stakeholders

Are all the stakeholders included in my IROPS Planning?

This section provides suggestions and guidance for identifying the necessary stakeholders to ensure effective communication and collaboration during IROPS events.

Because each airport's situation is different, identifying the key stakeholders to be involved in local IROPS contingency response planning can be challenging.

With recognition that airport response planning is required by U.S.DOT and FAA regulations, the key stakeholders required to meet these regulations (as indicated in **Figure 6**) are:

- Airport operations representatives (to provide for deplanement, sharing of facilities, and sterile areas as required, generally including airside, landside, and terminal management);
- Representatives of all airlines (domestic and foreign carriers) serving the airport;
- Representatives of all airlines (domestic and foreign carriers) who have identified the airport as a diversion airport;
- TSA representatives; and
- CBP representatives (local personnel if CBP has a presence at an airport, or regional CBP representatives).

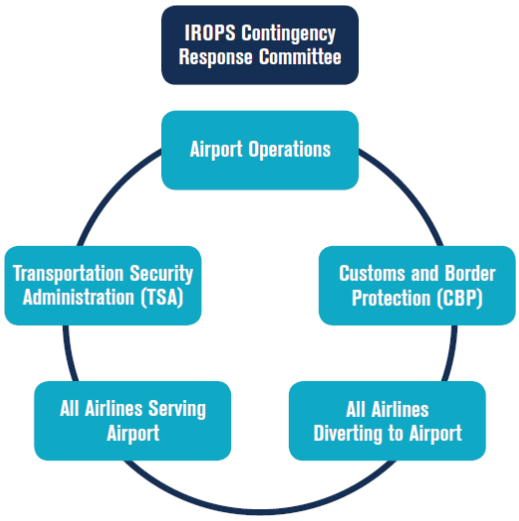


Figure 6. Key stakeholders required to meet DOT and FAA regulations.

It is recommended that each of these organizations keep the IROPS Chairperson or assigned designee (such as the IROPS Champion described in the next section) informed of their representative's current 24/7 contact information. Each representative should then:

- Participate in joint IROPS planning;
- Participate in joint IROPS risk assessment activities;
- Ensure their organization's support for sharing situational awareness during IROPS events; and
- Participate in "lessons learned" feedback and be accountable for follow-up actions required after IROPS events.

Excerpt from* ACRP Report 65 *on initial IROPS Planning Steps

The first step, whether your airport is developing a new plan or reviewing an existing one, is to establish executive buy-in from your airport and each of your aviation stakeholders. These should include airport operations, airlines, concessions, ground transportation providers, local hospitality industry, government agencies including Federal Aviation Administration (FAA), Customs and Border Protection (CBP) and Transportation Security Administration (TSA), fixed-base operators (FBOs), refueling companies, military units (if a joint-use facility), and airport emergency response.

Next, your airport should create an IROPS Contingency Response Committee (sometimes referred to as the IROPS Planning Committee) that includes representatives from each of your local service stakeholders. The Committee should be led by an IROPS Chairperson, who typically is a representative of your airport operations organization. The goal of your airport's Committee will be to establish and enhance contingency plans for participant stakeholders through their collective, cooperative, and collaborative decision making.

In addition to these key stakeholder representatives, it is recommended that several other stakeholder organizations be considered for membership on the airport's IROPS Contingency Response Committee. These organizations include:

- Airport organizations that provide services to passengers or aircraft during an IROPS event, including an emergency operations or communications center, concessions, passenger services, maintenance, public relations, and FBOs;
- FAA (both FAA Tower and, if appropriate, FAA TRACON);
- Airport police department;
- Airport fire and rescue department (ARFF); and
- Local military operations (if a joint-use facility).

Participation of other stakeholders on the committee can be achieved by forging agreements and/or by appointing an airport staff member to represent that group's interest. Other stakeholders that should be included are:

- Airport operations representatives at regional airports;
- Airline station managers at regional airports;
- Airline operations centers (System Operations Center [SOC]/Airline Operations Center [AOC]) for all airlines serving the local airport;
- Airline chief pilot's offices (if available);
- Cargo airlines at the local airport;
- FAA Air Route Traffic Control Center (ARTCC) (Enroute Center);
- FAA Command Center;
- TSA regional representatives (if not already engaged as key local members of the IROPS Contingency Response Committee);
- CBP regional representatives (if not already engaged as key local members of the IROPS Contingency Response Committee);
- Centers for Disease Control and Prevention (CDC) representatives;
- Local police representatives;
- Local fire department representatives; and
- Other (outside) mutual aid providers, including the Red Cross, local ground transportation, and local hotel/motel providers.

Appendix A.3 in Part 1 of this guidebook provides an expanded list of potential stakeholder organizations to be considered for participation in the airport's IROPS contingency response planning. Airports are encouraged to review this list and consider expanding their IROPS Contingency Response Committee membership as they deem appropriate.

Airports that have successfully implemented an IROPS Contingency Response Committee usually find that coordination among stakeholders is more efficient when they appoint an Airport IROPS Champion who supports the IROPS Chairperson.

How are stakeholder contacts maintained?

Once airports have considered additional stakeholders for ongoing IROPS planning efforts, they should obtain and maintain buy-in from all stakeholders identified. It is recommended that an airport's IROPS Contingency Response Committee take a team approach to establishing and sustaining relationships with stakeholder organization contacts. The suggested approach involves the IROPS Chairperson, in agreement with the IROPS Contingency Response Committee, assigning a committee person to an "IROPS Champion" position. The IROPS Champion takes the lead on managing the stakeholder contact effort (among other responsibilities outlined later in this guidance). Smaller airports may rely on the Chairman of the IROPS Contingency Response Committee to also serve as IROPS Champion.

It is recommended that the IROPS Champion build a Stakeholder Contact Team using IROPS Contingency Response Committee members who represent airport operations, concessions, airline station managers, and government agencies, given that these organizations have the primary contacts with additional stakeholder groups.

The Stakeholder Contact Team should be responsible for the following tasks:

- Developing and implementing a strategy for maintaining stakeholder's current 24/7 contact information and for generating stakeholder participation in IROPS-related communication activities;
- Collecting stakeholder contact information (referencing, as appropriate, the checklist for maintaining a Stakeholder Contact List provided in **Part 1—Appendix A.4** and the expanded template for stakeholder contact details provided in **Part 1—Appendix A.5** of this guidebook); and
- Meeting regularly to discuss known stakeholder contact changes and the overall status of stakeholder contact information, as described in **Part 1—Appendix A.4.**

3.2 Use Data Sources

What data sources are available to airports?

This section describes publicly available data sources sponsored by various federal agencies and other agencies. These data sources can assist airports in obtaining real-time flight status data, weather forecasting, and historic airport data, including diversion data, which can be used to improve IROPS response efforts and situational awareness among stakeholders during an event. The main sources of these data are BTS, FAA, TSA, CBP, and the National Oceanic and Atmospheric Administration (NOAA).

A common IROPS response planning challenge faced by airports is the need to gather and analyze real-time airline flight data (specifically flight diversion data) and to understand the potential impacts of forecasted weather in a region in order to accurately assign resources to manage an impending event.

Another critical part of the IROPS planning comes from reviewing historical flight data in conjunction with historical weather data. In combination, historical flight data that includes the number of IROPS events and their subsequent impacts (e.g., lengths of delays, number of aircraft delayed, and number of flight diversions) together with related historical weather information for the airport's region during the same time period can generate knowledge useful in improving local event prediction capabilities.

The next sections describe information for each public data resource. Additional information related to these and other federal and subscription flight data sources is provided in **Part 1—Appendix A.6.**

Although federal flight data resources are identified that provide airports real-time notification of flight delays, no federal sources were identified that provide real-time notification of flight diversions.

Real-time Airport Status Data

- **Air Traffic Control System Command Center (ATCSCC) Web Portal.** ATCSCC maintains a web portal at http://www.fly.faa.gov, which consists of multiple flight data resources. Airports accessing this website can obtain data from links to the following: an Advisories Database, Diversion Forums, the Aviation Information System (AIS), Current Reroutes, Current Restrictions, the Operation Information System (OIS), and Flight Delay Information.

  Airports also can purchase a subscription service from the FAA to obtain the operating status of the nation's largest airports and delay information on a wireless device, pager, phone, PDA, or email in real time, as changes happen.

Weather Data

- ***Aviation Weather Center Web Portal.*** NOAA's Aviation Weather Center maintains a web portal at http://aviationweather.gov. This web portal provides weather observation and forecast data for a variety of weather conditions, including convection, turbulence, icing, winds, ceiling, visibility, and others. It produces and updates a variety of weather products used by the FAA, such as Collaborative Convective Forecast Product (CCFP), Extended Convective

Forecast Plot (ECFP), National Convective Weather Forecast (NCWF), and Meteorological Terminal Aviation Routine Weather Reports (METARs). The portal also is used to publish various advisories, including Significant Meteorological Information (SIGMET) and graphical Airmen's Meteorological Information (AIRMET). Airports can use this site, along with information from local weather forecasting agencies, to communicate and evaluate real-time weather data with stakeholders to assess the probability of an impending IROPS condition.

Historic Airport Information, including Diversion Data

- **Aviation Data and Statistics.** FAA's Aviation Data and Statistics web portal is available at www.faa.gov/data_research/aviation_data_statistics/. Airports can obtain operational statistics on airline and airport performance, including on-time performance and delay causes, FAA operations and performance data, and U.S.DOT airline statistics.
- **BTS.** BTS provides airline on-time statistics data through its web portal http://apps.bts.gov. Airports can access data that includes summary statistics reporting all flights, late flights, and diverted or canceled flights. BTS datasets also provide detailed statistics on on-time departure and arrival performance by airport and airline as well as airborne time, cancellation, and diversion count by airport and airline.
- **Aviation System Performance Metrics (ASPM).** Airports can access portions of ASPM data at http://aspm.faa.gov. These data include airport analysis, city pair analysis, and taxi time data. Diversion data, however, is not currently part of the publicly available information. For example, ASPM provides a next-day diversion report, but this report is only available to the ATCSCC. Airports may want to consider requesting desired information through their local FAA office. Additional information that can be requested includes the ASPM Diversions Summary Report, which provides counts of diversions by date, by airport, or by another specified grouping.
- **Traffic Flow Management System Counts (TFMSC).** Traffic Flow Management System Counts contains data derived from the Traffic Flow Management System (TFMS) and can be accessed at https://aspm.faa.gov/tfms/sys.main.asp. The TFMS is a real-time aircraft tracking system used operationally by all FAA Air Traffic Control (ATC) personnel to direct aircraft flow in the National Airspace System (NAS). The TFMSC contains value-added fields and assumptions that can provide robust information to airports.
- **FAA Operations Network (OPSNET).** FAA maintains data on air traffic activity at ARTCCs, including preliminary airport traffic counts, instrument operations, instrument approaches, and delays, in the OPSNET database at https://aspm.faa.gov/opsnet/sys/main.asp. "Air traffic activity" refers to the total number of instrument operations at FAA and contractor-controlled airports, as well as aircraft handled at ARTCCs. Airports can use this data source to create a report that shows Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) itinerant operations (arrivals and departures) and local operations at an airport as reported by Air Traffic Control Towers (ATCTs).
- **Airline Service Quality Performance System (ASQP).** ASQP data, available at https://aspm.faa.gov/asqp/sys/main.asp, provides gate arrival and departure data in addition to wheels-off and wheels-on times for carriers that represent at least 1% of domestic enplanements (historically from 10 to 20 carriers). On this web site, airports can find out the causes of specific flight delays (e.g., carrier-related, extreme weather-related, NAS-related, security-related, and late arriving aircraft).

Code-Sharing Data

U.S.DOT's Air Carrier Licensing Division, within the Office of International Aviation, maintains an informal code-share list for various types of air carriers at http://www.dot.gov/policy/aviation-policy/licensing/code-sharing. This informal compilation of code-share relationships does not represent a complete compilation of all code-shares, as new code-share relationships are continually being developed. It is also important to note that this list is not an official U.S.DOT

document. The list may provide useful information to diversion airports that may occasionally receive diverted flights from carriers they normally do not service.

Other Flight Data Resources

Numerous other flight data sources exist for information related to air travel in the United States. In this guidebook, **Part 1—Appendix A.6** provides an alphabetical listing of data resources with brief explanations of available data, and uniform resource locators (URLs) indicated unless restricted, and indications of which data sources require a fee for use.

3.3 Improve Stakeholder Cooperation

How can airports improve cooperation with stakeholders?

This section focuses on understanding, documenting, and discovering methods to improve the way stakeholders communicate and collaborate with one another.

Recognizing stakeholder interdependencies is the first step that airports can take to improve cooperation during an IROPS event. Once stakeholder membership has been established and/or expanded by the Stakeholder Contact Team of the IROPS Contingency Response Committee (as described in **Section 3.1**), the team should review and document the information elements needed for stakeholder communications by:

- Developing, reviewing, and maintaining IROPS-related communications checklists for an airport as required. **Part 1—Appendix A.3** provides a starting place for reviewing and documenting communications dependencies for an expanded list of stakeholders. Organized by stakeholder organization, the list details what type of information is needed by each stakeholder who should send or receive information before, during, and after an IROPS event, and indicates communications media where appropriate. (**Figures 7** and **8** in this section illustrate a sample checklist and a top-level view of the recommended communication flow between major stakeholders using the material in **Part 1—Appendix A.3.**)
- Providing communications recommendations to the IROPS Contingency Response Committee. The Annual IROPS Checklist provided in **Part 1—Appendix A.7** can be used by the Stakeholder Contact Team to help ensure that communications recommendations are considered by the larger group on a yearly basis.
- Developing and maintaining communications-related training, including training for front-line responders, for inclusion in an airport's IROPS training plans.
- Keeping airport administration and leaders, airport staff, airline staff, and government agencies informed about IROPS-related communications.

It is important to note that many stakeholders play a vital role in IROPS events, but not all stakeholders have representation on the IROPS Contingency Response Committee. It is essential that the Stakeholder Contact Team remember to consider the communications needs of stakeholders that are not committee members and include input from those represented by documented agreements as well as those whose interests are represented by designated airport staff members acting on their behalf. Doing this will help ensure that communication gaps are filled.

Figure 7 shows an excerpt from **Part 1—Appendix A.3** that details the communication needs of local airline station managers (or their representatives) before an IROPS event occurs. This appendix also includes lists that address this stakeholder group's communication needs during and after an IROPS event, and provides similar checklists for each of the potential stakeholder organizations identified in this guidance.

Figure 8 provides a top-level view of the recommended communication flow between major stakeholders involved in IROPS events using the material provided in **Part 1—Appendix A.3.**

Stakeholder Group Communications Matrix					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** *Before, During, and After IROPS Events*	**Information (To) or (From) Organization (or via communication method)**
Airline Station Managers (at local airport)	YES	Participates in local IROPS response planning	BEFORE	Airline Equipment & Facilities on site	(To) IROPS Contingency Response Committee
				Facilities & Gate Sharing Agreements	
				Airline – Airline Support Agreements	
				Ground Handling Capability & Agreements	
				Fueling Agreements	
				Catering Agreements	
				Deicing Agreements	
				CBP Agreements	
				TSA Agreements	

Figure 7. Sample airline station manager communication matrix.

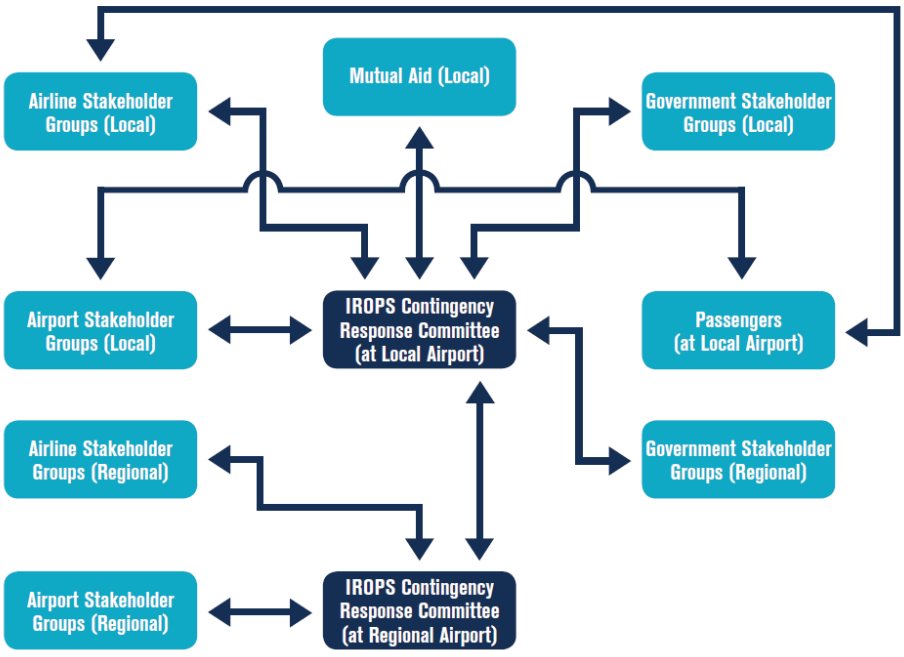


Figure 8. Top-level diagram of stakeholder communication flow.

3.4 Evaluate Plans and Training

What guidance is available to assist airports in evaluating IROPS plans and improving IROPS training?

Three research products generated by ACRP Project 10-23 are highlighted in this section. They are: IROPS case studies and U.S.DOT aviation enforcement order summaries, IROPS tabletop exercise scenarios, and the IROPS Risk Assessment Tool. This section also provides a discussion of how airports can use these three products to enhance current IROPS plans and improve training, particularly in regards to improving stakeholder coordination.

IROPS Case Studies and U.S.DOT Aviation Enforcement Order Summaries

Case study situations and U.S.DOT aviation enforcement order summaries developed for this guidance as part of the ACRP Project 10-23 research plan describe best practices or lessons learned from IROPS responses by airports and/or airlines that could be useful for consideration during the development of airport IROPS contingency response plans. These include:

- **Case Studies.** Based on a wide range of IROPS response planning and management situations, including best-practice examples from airports of different sizes (large, medium, and small hub, non-hub, and diversion airports) and from airlines, the case studies present responses to the four main categories of IROPS impact situations related to passenger service. Specifically,
  - *Surge* situations include the rush of passengers throughout terminals and security areas, as well as the volume of aircraft requiring gates due to an IROPS event;
  - *Capacity* situations refer to the ability of an airport terminal to accommodate passengers, as well as the number of gates available to handle aircraft either delayed or diverted there;
  - *After-hours* situations involve conditions related to staffing TSA and CBP security positions beyond normal business hours and ensuring that concessions are staffed and stocked appropriately to handle extra passengers; and
  - *Extended-stay* situations involve planning to ensure that passengers, especially those with special needs, are accommodated both in terminals and off-site at hotels during events lasting more than 24 hours.
- **Summaries of U.S.DOT Aviation Enforcement Orders.** Recognizing that current tarmac delay regulations relate to both airports and airlines, U.S.DOT aviation enforcement orders that relate to IROPS events can indicate situations, regulatory interpretations, and topics that are helpful to consider during the IROPS response planning process. The U.S.DOT Office of Aviation Enforcement and Proceedings conducts ongoing monitoring of airline and airport compliance related to the following:
  - *Airlines (both domestic and international carriers) are required to:*
    - Adhere to the 3-Hour Rule (domestic carriers) and the 4-Hour Rule (international carriers) by:
      - Providing adequate on-board food, water, restrooms, medical attention, etc.;
      - Sharing facilities and making gates available; and
      - Providing assurance that plans have been coordinated with airport authorities, CBP, and TSA. Provide assurance of coordination with each Airport that the carrier serves including diversion airports, large hub airports, medium hub airports, small hub airports, and non-hub primary airports.
    - Provide airline contingency plans for lengthy tarmac delays (since May 14, 2012) and update them regularly according to the U.S.DOT's 3-year cycle.

  - *Airports are required to:*
    - Provide local IROPS Contingency Plans (since May 14, 2012) and update them regularly according to the U.S.DOT's 5-year cycle;
    - Provide for deplanement of passengers following excessive tarmac delays;
    - Provide for sharing of facilities and in making gates available; and
    - Provide a sterile area, in the event of excessive tarmac delays, for passengers who have not yet cleared CBP screening.

The case study results and U.S.DOT Aviation Enforcement Order summaries provided in **Part 1—Appendix A.8** of this guidebook offer a structured series of recommended topics and associated actions that can be used in subsequent IROPS response planning by airports and airlines. Some overarching best practices and lessons learned include the following:

- **All** organization respondents need to understand:
  - Relevant DOT and FAA regulations and requirements,
  - Their organization's IROPS contingency process, and
  - Communication and collaboration agreements with other organizations.
- This understanding requires fully aligned and coordinated plans and associated training that involves everyone from management-level decision makers down to the front-line workers.
- Establishing and maintaining shared situational awareness during an IROPS event is important across all regional stakeholders and involves communicating real-time flight and weather data as well as airport capacity constraints with one another.

Part 1—Appendix A.8 includes a table that highlights the case studies and U.S.DOT aviation enforcement order summaries examined in ACRP Project 10-23, along with the major takeaways related to each. The appendix also outlines the best practices and lessons learned, and provides detailed individual case study and summary descriptions.

IROPS Tabletop Exercise Scenarios

The eight tabletop exercise scenarios that were developed as part of ACRP Project 10-23 can be used to fine tune IROPS contingency plans and ensure consistent understanding of roles and responsibilities (see **Figure 9**).

These exercises are designed to:

- Evaluate performance during a simulated IROPS event to assess readiness of key personnel at all levels among the various stakeholder organizations involved in the IROPS response;
- Provide the information and means by which airport stakeholders can determine how well current communication and collaboration strategies create common situational awareness during IROPS events;
- Provide a structure for evaluating the response to an IROPS event based on activating current IROPS-related plans, standard operating procedures (SOPs), and agreements already in place;
- Involve senior staff from all IROPS Committee stakeholders in informal group discussions centered on hypothetical, yet realistic, situations; and
- Make it possible to tailor and scale the exercises to meet specific airport customer service needs and concerns.

As shown in **Figure 9,** the eight tabletop scenarios are organized into three groups for use before, during, and after IROPS events. Whereas the before-event and after-event tabletops are more oriented toward airport and stakeholder processes, the during-event tabletops have been developed to help assess stakeholder performance, particularly related to communication and collaboration, when confronted with the most common causes of IROPS events. These tabletop scenarios incorporate various IROPS conditions or causal factors (e.g., weather, power outages,

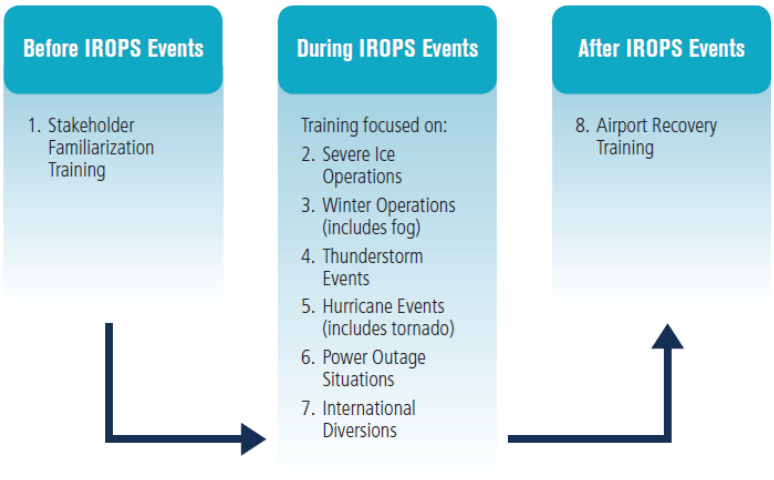


Figure 9. Eight tabletop exercise scenarios.

etc.) and provide both airline and airport impact scenarios. **Part 1—Appendix A.9** provides more-detailed descriptions of the tabletop exercise scenarios, along with details on how to access the editable tabletop narrative files provided on **CRP-CD 180.**

IROPS Risk Assessment Tool

Developed as part of ACRP Project 10-23, the IROPS Risk Assessment Tool can assist airports with evaluating the effectiveness of their strategies for addressing specific IROPS events.

This tool focuses planning efforts on the airport's most important IROPS response considerations by addressing these key objectives:

- Supporting airport stakeholders in assessing stakeholder preparedness for IROPS events;
- Highlighting strengths and weaknesses in IROPS impact migration plans, including improving communications among stakeholders; and
- Prioritizing investments of time, responsibility, and capital needed for response capability.

The IROPS Risk Assessment Tool can focus stakeholders' attention on improvements that can be made to plans to mitigate impacts from future IROPS events. Using this tool also can enhance communication among stakeholders by facilitating automated exchanges of information on past events and establishing common awareness of planned mitigation strategies for future events. Outputs from the IROPS Risk Assessment Tool help identify airports' shortfalls in mitigating impacts from IROPS events and highlight decisions that need to be made to improve the IROPS response plans.

Airports can use the IROPS Risk Assessment Tool to evaluate response alternatives to historical IROPS events and for predictive evaluations related to potential future events. Users can assemble sufficient data to (1) define baseline response capabilities and preparedness levels and (2) produce a report for each stakeholder on their IROPS risk levels for defined scenarios.

The IROPS Risk Assessment Tool uses a generic risk assessment process to evaluate risk response contingencies. The process is incorporated into a Microsoft Excel-based series of worksheets designed to support airport stakeholders in assessing stakeholder preparedness for IROPS events and in evaluating and improving IROPS mitigation plans.

Part 2 of this guidebook presents the complete IROPS Risk Assessment Tool User's Guide, which also appears in electronic form on **CRP-CD 180**. The User's Guide provides information on how The Tool works, along with guidance on using The Tool and information on the means for assessing risk.

Managing the IROPS Risk Assessment Tool

It is recommended that the IROPS Champion appoint a member of the IROPS Contingency Response Committee to act as an IROPS Risk Assessment Coordinator to manage and implement the IROPS Risk Assessment Tool.

The IROPS Risk Assessment Coordinator, with support from the IROPS Champion, should facilitate the committee's stakeholder members in:

- Understanding the purpose of the IROPS Risk Assessment Tool;
- Maintaining the airport's profile description;
- Confirming each stakeholder organization's representative for evaluating their risk contingency mitigation plans;
- Maintaining an airport IROPS event history summary and related initial mitigation plans; and
- Testing IROPS Plan updates (as discussed in the section on improving plans and training).

The IROPS Risk Assessment Coordinator's position is key to developing an airport's IROPS risk assessment and, as needed, the airport's revised mitigation plans. Dedicating an individual to this responsibility is essential to the effectiveness of using this tool.

How can airports review and update IROPS plans and training?

The case studies, U.S.DOT aviation enforcement order summaries, tabletop training scenarios, and IROPS Risk Assessment Tool provided with this guidebook offer guidance for evaluating various areas of an airport's IROPS plans. After becoming familiar with these materials, it is important to conduct an overall review of an airport's IROPS Plan (or associated plans and processes) and update it with improved procedures as needed.

Following any IROPS Plan update, it is advisable to develop or update related training plans to communicate the new information and changes, emphasizing any improvements to coordinated stakeholder response efforts. Doing this is especially critical when execution of a revised stakeholder contingency response procedure depends on information or other support from one or more other stakeholder organizations.

It is also important to note that joint training with all related stakeholders should be held. Ideally, this type of training will include both management and front-line employees to ensure that all parties understand the latest airport strategy and updated response plan procedures.

3.5 Guidance During an Event

How can airports improve performance during an IROPS event?

During an IROPS event, the most important elements of IROPS response activities depend on shared situational awareness. This section provides guidance for all stakeholders to create a real-time understanding with one another.

Stakeholders need to focus on three critical actions during an IROPS event: communication, coordination, and collaboration. As shown in **Figure 10,** achieving this focus requires stakeholders to work together to provide current status information to create shared situational awareness.

Shared situational awareness can be created by focusing on the following tasks during an IROPS event:

- **Activating shared responsibilities.** The first task is to assess readiness by making sure all stakeholders understand triggers for activating responsibilities during an event. **Part 1—Appendix B.1**

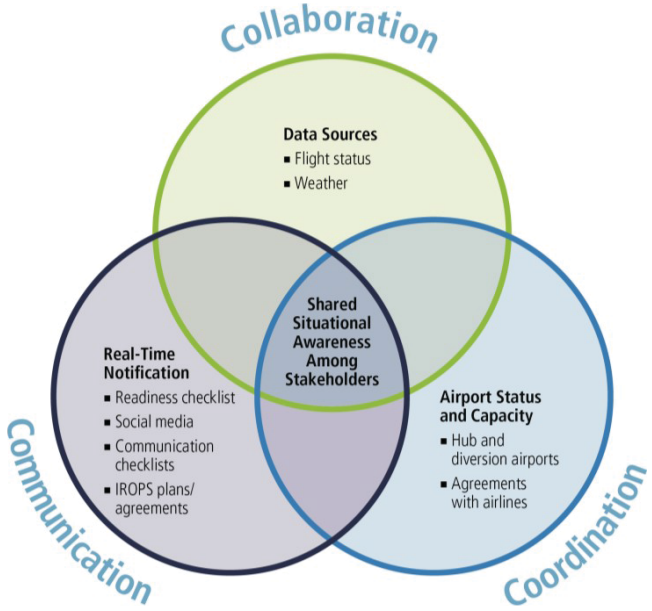


Figure 10. Creating shared situational awareness.

provides details on how to assign responsibilities to stakeholders so IROPS triggers can be anticipated, mitigated, and/or adapted to in real time.

- **Implementing notification protocols in real time.** Airports are encouraged to use social media to communicate with stakeholders and the public because this technology can provide information simultaneously to numerous stakeholders in real-time. It can be used to create shared situational awareness by providing timely notification of events, triggering IROPS Plan and associated agreement activation, and giving periodic status updates. The challenges associated with using social media are ensuring that the information communicated is current and accurate and avoiding conflicting messages among stakeholders. **Part 1—Appendix B.2** provides recommended guidance on how to make social media a part of a managed and coordinated IROPS communication process among stakeholders. As a notification tool, social media should be incorporated into airport IROPS plans, agreements and communication checklists.
- **Activating communication checklists.** These checklists, described in the section on improving stakeholder cooperation, are provided in **Part 1—Appendix A.3.**
- **Utilize chosen data sources, including weather data sources.** To understand the magnitude of a situation and keep abreast of changing conditions, it is recommended that airports use flight and weather data sources as described in the section on using data sources and in **Part 1—Appendix A.6.** Keeping an eye on flight delays and impending weather is critical, as a majority of IROPS events are caused by disruptions to airline schedules. Airports also are encouraged to share which data sources they use with all stakeholders, which can foster better understanding among them.
- **Implementing working agreements with airline stakeholders.** It is recommended that diversion airports establish agreements with each domestic and foreign carrier that has identified the airport as a diversion airport. Agreements should specify that the airline must notify the diversion airport of a flight diversion decision as that decision is made. The timely sharing of information between stakeholders gives the airport a chance to prepare for incoming aircraft and passengers.

3.6 Improve Plans and Training

What additional methods can airports use for continuous improvement?

This section focuses on creating a shared system for managing recovery efforts. It also includes an assessment process for improving debriefing discussions, and provides a system for creating accountability to ensure that IROPS plans are updated and training is implemented after a significant lesson is learned from an IROPS event. It summarizes how the IROPS Risk Assessment Tool can be used for testing the effectiveness of changes made to IROPS plans.

Although most airports hold debriefing meetings with stakeholders after IROPS events to review their performance effectiveness and document recommended changes, they are not always as successful at incorporating the recommended changes into revised plans and training. Accountability measures can be put in place to ensure that lessons learned translate into new policies and practices. Several methods have been designed to assist airports with continuous improvement measures. These methods are introduced in the balance of this section, with additional details and guidance provided either in designated appendices to this guidebook or on **CRP-CD 180** as indicated.

Defining a Recovery Process

Post-IROPS event recovery efforts are best performed immediately following the IROPS event. Planning for these efforts with stakeholders and assigning specific roles and responsibilities ahead of time will help mitigate long-term impacts on airport operations and passenger care. **Part 1—Appendix C.1** provides more-detailed guidance on defining a shared recovery process with stakeholders.

Improving the Debriefing Process

Determining how an airport and stakeholders view their performance during an IROPS event provides additional insights into needed improvements. An assessment tool that examines IROPS preparedness on a scale from reactive to proactive (or fully optimized) is provided in **Part 1—Appendix C.2.**

Establishing an Accountability Process for Updating Plans and Training

Procedures have been developed to assist stakeholders in holding one another accountable for continuously improving IROPS-related plans and training. These procedures are organized into a checklist in **Part 1—Appendix C.3.** The checklist incorporates the use of either an After-Action Report (AAR) or an Action Item List that includes a responsibility log to track progress. The procedures involved also include:

- Scheduling follow-up meetings to report progress,
- Making IROPS updates, and
- Designing and facilitating training to ensure that new policies and procedures are understood and followed.

Testing IROPS Plan Effectiveness

Once the IROPS plans have been updated with recommended improvements, the IROPS Risk Assessment Tool can be useful in evaluating the effectiveness of proposed updates and will

provide documentation of the expected results. The Tool also offers an opportunity to collaborate with stakeholders outside of an IROPS situation.

With support from the IROPS Champion, the IROPS Risk Assessment Coordinator can facilitate the committee's stakeholder members in testing the IROPS Plan. Instructions for the IROPS Risk Assessment Coordinator can be found in the IROPS Risk Assessment Tool User's Guide provided in Part 2 of this guidebook and on **CRP-CD 180.**

Conducting Seasonal IROPS Training

Airports report that the timing of training is critical. It is recommended that airports identify the season when the majority of their IROPS events occur and schedule stakeholder training to occur before this time period. This type of seasonal refresher training reminds all participants of their roles and responsibilities and provides the optimal time to introduce any new procedures designed to improve performance during IROPS events.

Airports that host fall/winter and spring/summer refresher training can ensure that everyone is primed and ready for those particular seasons. During these seasonal training sessions, it is helpful to review how the past year's IROPS events were handled by all stakeholders. These training sessions also can involve the use of tabletop training exercises such as those provided on **CRP-CD 180** to test and further refine participants' knowledge and plans to improve performance.

SECTION 4

Summary

This guidebook provides various approaches and tools for improving stakeholder coordination and communication before, during, and after an IROPS event. It includes answers to the most common questions that airports face when focusing on stakeholder inclusion.

4.1 Before an IROPS Event

Are all the stakeholders included in my IROPS Planning?

Airports are encouraged to review the expanded list of stakeholders provided in **Part 1—Appendix A.3** and consider adding members to their IROPS committees as they deem appropriate. Once the airport has chosen additional stakeholders for the IROPS Contingency Response Committee, it is important to obtain and maintain buy-in from all stakeholders identified. Ongoing communication can be established by forming a Stakeholder Contact Team made up of IROPS Contingency Response Committee members representing airport operations, concessions, airline station managers, and government agencies, as these organizations will have primary contacts with other stakeholder groups. The Stakeholder Contact Team will enable the IROPS Committee to strategize easily on various recommended procedures to use in order to keep 24/7 contact information current.

What data sources are available for airports to use?

Airports can access the data sources referenced in this guidance that are sponsored by various federal governmental agencies and non-governmental agencies to obtain real-time flight status data, weather forecasting data, and historic airport data. The data sources include options for gathering real-time airline flight data (specifically flight diversion data) and for understanding the potential impacts of forecasted weather in a regional area in order to assign resources accurately to manage an impending event. Combining historic flight data with the concurrent, related historical weather information for an airport's region can improve local event prediction capabilities.

How can airports improve cooperation with stakeholders?

An airport Stakeholder Contact Team can be created that recognizes stakeholder interdependencies by reviewing and customizing the stakeholder communications checklists provided in *ACRP Report 153*. It is also suggested that the team provide communications recommendations to the IROPS Contingency Response Committee, develop and maintain communications-related training (including front-line use) for inclusion in an airport's IROPS training plans, and keep airport administration and leaders, airport staff, airline staff, and government agencies informed about IROPS-related communications.

What guidance is available to assist airports in evaluating the IROPS Plan and improving IROPS training?

ACRP Report 153 includes case studies from airports of various sizes in **Part 1—Appendix A.8.** These case studies list important topics and associated actions that focus on stakeholder communication issues and best practices. Insights from these case studies can be used by airports to update policies in their IROPS plans to strengthen communication measures with stakeholders.

The tabletop exercise scenarios also developed as part of ACRP Project 10-23 can be used to test changes and updates to airport IROPS plans, helping ensure consistent understanding of various stakeholder roles and responsibilities during IROPS events. This consistency is especially important when a revised stakeholder contingency response procedure requires information or other support from one or more stakeholder organizations.

The IROPS Risk Assessment Tool can assist airports with evaluating the effectiveness of their strategies for addressing specific IROPS events. This tool can be used to engage various stakeholders to communicate on complicated or challenging IROPS-related issues.

4.2 During an IROPS Event

How can airports improve performance during an IROPS event?

Airports are encouraged to focus on several tasks that improve stakeholder coordination during IROPS events. For example, airports can:

- Assess readiness by making sure all stakeholders understand triggers for activating responses to an event;
- Implement real-time notification protocols using social media to communicate with stakeholders and the public, as this technology can provide information simultaneously to numerous stakeholders in real time;
- Activate the provided communication checklists with stakeholders during events, which will help keep the correct information flowing; and
- Use chosen flight and weather data sources and communicate facts from these sources to various stakeholders to help create shared situational awareness.

Another recommendation is for diversion airports to implement agreements with each domestic and foreign carrier that has identified the airport as a diversion airport to provide diversion information as soon as possible to allow the airport adequate time to prepare for this situation.

4.3 After an IROPS Event

What additional methods can airports use for continuous improvement?

Planning for IROPS recovery efforts with stakeholders and assigning roles and responsibilities ahead of time will help mitigate long-term impacts on passenger care. Airports also can benefit from improving the debriefing process through an assessment of the performance of the airport and its stakeholders during the IROPS event. Beyond this, airports can make use of the guidance provided that details an accountability process for updating plans and training. Use of AARs or Action Item Lists with responsibility logs can help an airport track progress in improving IROPS response and recovery efforts. The process also involves scheduling follow-up meetings to hold assigned personnel accountable for remedying problems, making IROPS updates, and designing and facilitating training to ensure that new policies and procedures are understood and followed.

Once IROPS plans have been updated with recommended improvements, the IROPS Risk Assessment Tool can be useful in evaluating the effectiveness of the proposed updates and providing documentation of the expected and actual results. Use of The Tool also can facilitate collaboration with stakeholders outside of an IROPS situation. Finally, it is suggested that airports provide seasonal refresher training to remind everyone of their roles and responsibilities during IROPS events. Seasonal training provides the optimal time to introduce new procedures designed to improve performance during IROPS events and ensures that all parties are primed and ready for events that are likely to occur at that time of year.

Using these tools and recommendations, airports can more easily meet the requirements of U.S.DOT and FAA regulations related to coordinating stakeholders, can improve relationships among stakeholders, and can improve collaborative performance related to IROPS response.

Bibliography

Transportation Research Board

Corzine, S. 2013. *ACRP Report 93: Operational and Business Continuity Planning for Prolonged Airport Disruptions.* Transportation Research Board of the National Academies, Washington, D.C.

DeLong, J., et al. 2013. *ACRP Report 92: Guidebook to Creating a Collaborative Environment Between Airport Operations and Maintenance.* Transportation Research Board of the National Academies, Washington, D.C.

Griffith, D., et al. 2014. *ACRP Report 112: Airport Terminal Incident Response Planning.* Transportation Research Board of the National Academies, Washington, D.C.

Karlsson, J., et al. 2014. *ACRP Report 106: Being Prepared for IROPS: A Business-Planning and Decision-Making Approach.* Transportation Research Board of the National Academies, Washington, D.C.

Nash, J. M., et al. 2012. *ACRP Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning.* Transportation Research Board of the National Academies, Washington, D.C.

Federal Agencies

Federal Aviation Administration. (n.d.) FAA Airport Categories. U.S. Department of Transportation, Washington, D.C. Available online at http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories/.

Federal Aviation Administration. 2007. Introduction to Safety Management Systems (SMS) for Airport Operators (AC No. 150/5200-37). U.S. Department of Transportation, Washington, D.C. Available online at http://www.faa.gov/regulations_policies/advisory_circulars.

Federal Aviation Administration. 2014. Air Traffic Organization 2014, Safety Management System Manual Version 4.0. U.S. Department of Transportation, Washington, D.C. Available online at http://www.faa.gov/air_traffic/publications/media/faa_ato_SMS_manual_v4_20140901.pdf.

Federal Aviation Administration. 2014. NextGen Priorities Joint Implementation Plan Executive Report to Congress, 2014. Available online at http://www.faa.gov/nextgen/media/ng_priorities.pdf.

Federal Emergency Management Agency. 2010. Disaster Scenario Exercise for Organizational Planning: Major Hurricane with Coastal and Inland Flooding & Tornados. U.S. Department of Homeland Security, Washington, D.C.

National Transportation Safety Board. 2014. Crash of Asiana Flight 214 Accident Summary Report. U.S. Department of Transportation, Washington, D.C.

Office of Inspector General. October 9, 2014. Audit Report: Oversight Weaknesses Limit DOT's Ability to Ensure Passenger Protections During Long, On-Board Flight Delays. U.S. Department of Transportation, Washington, D.C.

Airports

Begg, D., et al. 2011. Report of the Heathrow Winter Resilience Enquiry. London, England.

Dallas/Fort Worth International Airport. Event Contingency Plan for Irregular Operations.

Kanwar, V. J., et al. 2014. Toronto Pearson January 2014 Operations Disruption Review and Recommendations, GTAA, Toronto, Canada.

Minneapolis–Saint Paul International Airport. Irregular Operations Plan.

Meetings and Conferences

Agnew, R., et al. 2012. Dissemination Workshops for *ACRP Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning.* Washington, D.C., April 20, 2012; Chicago, IL, May 24, 2012; San Francisco, CA, May 30, 2012; Boston, MA, June 7, 2012; Atlanta, GA, June 19, 2012; Orlando, FL, June 28, 2012; Phoenix, AZ, July 11, 2012; and Los Angeles, CA, November 28, 2012.

Griffith, D., et al. 2014. TRB Webinar: Emergency and Disaster Preparedness: Cooperation and Coordination for Effective Response. Presented June 18, 2014. Online information available at www.trb.org.

Marks, J. 2014. Updating Airline Cancellation Cost and Customer Disruption. Presented at 54th AGIFORS Annual Symposium and Study Group Meeting, October 18–22, 2014, Dubai, United Arab Emirates, October 18–22, 2014.

Masterson, E., et al. 2015. ACRP Project 10-23, "IROPS Stakeholder Communication and Coordination." Presented at Minneapolis–Saint Paul International Airport, Minneapolis, MN, April 14, 2015.

Other

Civil Aviation Authority. 2010. *Aviation's Response to Major Disruption: Final Report.*

Diversion Forums. Air Traffic Control System Command Center Diversion Forums. Online forums available at http://www.fly.faa.gov/Diversion/diversion.jsp.

Federal Aviation Administration. 2014. Chicago Center Fire (September 26, 2014), Contingency Planning and Security Review. U.S. Department of Transportation, Washington, D.C. Available online at www.faa.gov/news/media/ZAU_Fire_Public_Review.pdf.

NATS. 2014. *Air Traffic Control Disruptions—Report to Civil Aviation Authority.*

Abbreviations

AAR	After-Action Report
AEP	Airport Emergency Plan
AIRMET	Airmen's Meteorological Information
AIS	Aviation Information System
AOA	Airport Operations Area
ARFF	Aircraft Rescue and Firefighting
ARTCC	Air Route Traffic Control Centers
ASOCS	Airport Security, Operations, and Compliance System
ASPM	Aviation System Performance Metrics
ATC	Air Traffic Control
ATCSCC	Air Traffic Control System Command Center
ATCT	Air Traffic Control Tower
ATM	Air Traffic Management
BTS	Bureau of Transportation Statistics
CBP	U.S. Customs and Border Protection
CCFP	Collaborative Convective Forecast Product
CDC	Centers for Disease Control and Prevention
CDF	Central Deice Facility
DOA	Department of Aviation
ECC	Emergency Communication Center
ECFP	Extended Convective Forecast Plot
EDT	Eastern Daylight Time
EOC	Emergency Operations Center
EMS	Emergency Management System
FBO	Fixed-Base Operator
FIDS	Flight Information Display System
FIS	Federal Inspection Station
GSE	Ground Service Equipment
IC	Incident Command
ICS	Incident Command Structure
IOCC	Integrated Operations Control Center
IMC	Instrument Meteorological Conditions
IROPS	Irregular Operations
KPI	Key Performance Indicators
LEO	Law Enforcement Officer
METAR	Meteorological Terminal Aviation Routine Weather Report
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NATS	*Formerly* NATCS (National Air Traffic Control Services)
NCWF	National Convective Weather Forecast
NEXRAD	Next-Generation Radar
NIMS	National Incident Management System
NOAA	National Oceanic and Atmospheric Administration
NOC	Network Operations Center
NOTAM	Notices to Airmen
NWS	National Weather Service
OCC	Operations Control Center
OIS	Operation Information System
OPSNET	Operations Network
OPSP	Overnight Passenger Service Plan

PA	Public Affairs	SIGMET	Significant Meteorological Information
PAX	Passengers	SMS	Safety Management System
PDA	Personal Digital Assistant	SOC	System Operations Center
PIDS	Passenger Information Display System	SOP	Standard Operating Procedure
PIO	Public Information Officer	TRACON	Terminal Radar Approach Control Facilities
SCC	Stakeholder Communication and Coordination	URL	Uniform Resource Locator

Glossary

3-Hour Rule	In April 2010, the U.S.DOT issued rulemaking on enhancing airline passenger protections (14 CFR Part 259, Enhanced Protections for Airline Passengers) that established rules covering domestic air carriers and prohibiting a domestic flight from remaining on the tarmac for more than 3 hours without allowing passengers to deplane subject to safety, security, and ATC exceptions. It also required (among other things) domestic airlines to adopt contingency plans for lengthy tarmac delays for scheduled and public charter flights at large and medium hub airports (DOT-OST-2007-0022).
4-Hour Rule	In April 2011, the U.S.DOT updated its rulemaking on enhancing airline passenger protections (14 CFR Part 259, Enhanced Protections for Airline Passengers). This extended the rules to include foreign air carriers and prohibited an international flight from remaining on the tarmac for more than 4 hours without allowing passengers to deplane subject to safety, security, and ATC exceptions. It also required (among other things) international airlines to adopt contingency plans for lengthy tarmac delays and expanded the airports at which all airlines must adhere to the contingency plan terms to include small hub and non-hub airports, including diversion airports. Carriers are required to coordinate their contingency plans with all of these airports as well as CBP and TSA (DOT-OST-2010-0140).
Americans with Disabilities Act of 1990 (ADA)	The ADA regulates accessibility by persons with disabilities in airport terminals, at curbs, on roadways, and on surface transportation. (42 U.S.C. § 12101 et seq.)
After-Action Report (AAR)	A report that describes the positives and negatives related to the handling of an IROPS event by service providers.
After-Hours Operations	Operations of service providers that take place outside of their normal working business hours or during hours outside of the peak hours of airport operation, when services are reduced or not available.

Air Carrier Access Act	This act and its implementing regulation, 14 CFR Part 382, prohibit discrimination in air travel on the basis of disability. The act applies primarily to air carriers' responsibilities for treatment of disabled passengers, but it also regulates the joint airport/airline responsibility to provide lift devices for providing access to aircraft for wheelchair bound passengers.
Air Carrier Aircraft	An aircraft that is being operated by an air carrier and is categorized as being (1) a large air carrier aircraft, if designed for at least 31 passenger seats, or (2) a small air carrier aircraft, if designed for more than nine passenger seats but fewer than 31 passenger seats, as determined by the aircraft type certificate issued by FAA under 14 CFR 139.5. General aviation aircraft include all other civilian-owned and civilian-operated aircraft.
Airline	An air transportation system operator, including its equipment, routes, operating personnel, and management.
Airport	An area of land or other hard surface, excluding water, that is used, or intended to be used, for the landing and take-off of aircraft, including any buildings and facilities (14 CFR 139.5).
Airport Operator	The public or private operator or sponsor of a public-use airport. This entity serves as the facilitating organization for the tabletop exercise and must be prepared to provide the necessary resources and provide the required space as determined by the IROPS Tabletop Planning Committee.
Cancellations	Flights canceled by airlines for a variety of reasons (e.g., mechanical issues, service issues like fuel, weather, or issues at the arrival or departure airport).
Capacity	The ability of an airport terminal to accommodate passengers and the number of gates available to handle aircraft either delayed or diverted there. IROPS events place demands on airport facilities and services that exceed capabilities (both airside and landside). The airport may reach or exceed capacity when the terminal becomes filled with passengers and ramp space/gates become filled with aircraft.
Causal Factors	The primary reasons IROPS events occur. These conditions are normally weather or operational in nature.
Customs and Border Protection (CBP) Office of Field Operations	CBP Field Operations Offices provide guidance to their regional ports and ensure the dissemination and implementation of core CBP guidelines. Offices also provide for mission support functions within their regions.
Concessionaire	The owner or operator of a concession (e.g., restaurants, retail shops).
Customers	Passengers and other non-aviation service personnel, such as "meeters and greeters" in the terminal area.
Debriefing	A formal process that uses a series of questions to reveal how well an IROPS event was handled by service providers.

Deicing	Removing snow, ice, and other contaminants from aircraft to ensure a clean aircraft prior to take-off.
Diversion Airport(s)	Airport(s) in the region surrounding an airport that are identified as diversion locations by airlines and are intended to be used as alternate landing locations.
Diverted Flight	A flight operated from the scheduled origin point to a point other than the destination point recorded in the carrier's published schedule. For example, a carrier has a published schedule for a flight from A to B. If the carrier were actually to fly from A to C, the A to C segment is a diverted flight.
Emergency Management	The process of preventing, mitigating, responding to, and recovering from all types of hazards and incidents that can threaten life and property.
Emergency Operations Center	A central command-and-control facility that is responsible for carrying out emergency management functions.
Emergency Response Providers	Any agency providing emergency assistance, such as airport police, local police, fire departments, and paramedics.
Enhancing Airline Passenger Protections	A rule issued by the U.S.DOT that improves the air travel environment for consumers. One key provision of this rule is the requirement for air carriers (both domestic and international) to adopt and adhere to tarmac delay contingency plans. This rule establishes the 3-Hour Rule and the 4-Hour Rule, which require air carriers to allow passengers to deplane after being out on the tarmac for 3 hours (domestic flights) or 4 hours (international flights).
Extended Ground Delays	Events that disrupt optimized flight schedules and negatively affect the normal flow of passengers through the air transportation system (e.g., severe weather, ATC complications, airport service issues, and airline operations difficulties). The outcomes of extended ground delays include crowded terminal spaces, distressed passengers, swamped airline passenger service agents, and other situations that demand the attention of the airport and airline (based on U.S.DOT's Development of Contingency Plans for Lengthy Airline On-Board Ground Delays).
Extended-Stay Events	Events that result in travelers staying overnight in a location other than their intended final destination. Extended-stay situations may result in travelers seeking ground transportation services and overnight hotel accommodations or they may result in travelers staying overnight in the airport.
Federal Inspection Services	CBP facilities set up to screen passengers and cargo at ports of entry throughout the United States.
General Aviation Aircraft	All civilian aircraft not owned or operated for commercial passenger transport.
General Aviation Airport	A public-use airport that primarily serves general aviation aircraft and is closed to air carrier operations except in unusual circumstances, such as emergencies.

Government Agencies	FAA, TSA, CBP, and other government agencies that operate at an airport or affect an airport's operation.
Ground Transportation Providers	All transportation entities that provide transportation service for passengers and customers including, but not limited to, rental car agencies (on- and off-site), taxi companies, and local mass transit entities.
Ground Stop	A traffic management initiative instituted by FAA involving a stop on aircraft departures to airports to manage arrival rates into destination airports to ensure that the capacity of destination airport facilities and runways is not exceeded by demand.
Irregular Operations (IROPS)	Exceptional events that require actions and/or capabilities beyond those considered usual by aviation service providers. Generally speaking, an impact of an IROPS event is the occurrence of passengers experiencing delays, often in unexpected locations for an undetermined amount of time. IROPS event examples include extreme weather events (e.g., snowstorms, hurricanes, tornados), geological events (e.g., earthquakes, volcanoes), and other events (e.g., power outages or security breaches).
IROPS Champion	A designated person, normally an employee of the Airport Operator, who leads the airport and its stakeholders in all IROPS-related activities (including the customization of tabletop exercises), to meet internal and external organizational needs.
IROPS Chairperson	A designated person, normally an employee of the Airport Operator, who leads the IROPS Contingency Response Committee and who may also act as the IROPS Champion.
IROPS Contingency Response Committee	A planning group that includes representatives of all local aviation service provider organizations. The goal of the airport IROPS Contingency Response Committee is to establish and enhance contingency plans through their collective, cooperative, and collaborative decision making. *Also called* IROPS Committee or IROPS Planning Committee.
IROPS Contingency Plan	A joint plan put together by an airport and stakeholders that include airlines or service providers that outlines their coordinated response measures for managing IROPS events. *Also called* IROPS Response Plan or IROPS Plan.
Large Hub Airport	An airport that accounts for at least 1% of the total annual enplanements in the United States. (U.S.DOT definition)
Late Flight	A flight that arrives at the gate 15 minutes or more after its published arrival time. (U.S.DOT definition)
Medium Hub Airport	An airport that accounts for at least 0.25% but less than 1.00% of the total annual enplanements in the United States. (U.S.DOT definition)
Non-hub Primary Airport	An airport that accounts for at least 10,000 enplanements but less than 0.05% of the total annual enplanements in the United States. (U.S.DOT definition)

On-Time Flight	A flight that arrives less than 15 minutes after its published arrival time. (U.S.DOT definition)
Overnight Accommodations	Include but are not limited to hotels and other facilities that could house passengers should an IROPS event occur.
Passengers	Include people traveling, service animals in the cabin, and live cargo on board aircraft and in the terminal area.
Passenger Core Needs	According to U.S.DOT's Development of Contingency Plans for Lengthy Airline On-Board Ground Delays: • **Information (flight status, gate status)—**information provided to the passenger so as to keep passenger informed on status of situation—situational awareness; • **Communication (cell phone usage, rebooking)—**a means of enabling the passenger to communicate; • **Food/hydration (grab-and-go food and water)—**types of sustenance made available to passengers; • **Cleanliness (availability of clean and serviceable restrooms)—**a means to address bodily needs and maintain personal hygiene; • **Special services (oxygen, medicine)—**a means to address health-related needs; and • **Executable plan to deplane aircraft—**concise information on steps that will be taken after a period of time.
Public Airport	An airport used or intended to be used for public purposes, which is under the control of a public agency, and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft is publicly owned (49 USC § 47102 [16]).
Recovery	The final phase of emergency response leading to the restoration of normal operations after an emergency or IROPS event. By this time, the airport has achieved a degree of physical, environmental, economic and social stability.
Refuelers	Fuel providers who supply fuel to airport customers and who may assist in the refueling of aircraft.
Regional Airports	Airports that are geographically associated near a hub airport and therefore are important participants in coordinated planning.
Service Providers	All entities at an airport that provide services for customers and passengers, including but not limited to airports, airlines, concessionaires, ground transportation agencies, government agencies, FBOs, providers of overnight accommodations (e.g., hotels), emergency responders (e.g., police, fire, EMTs), the military (if a joint-use facility), and diversion airports.
Small Hub Airport	An airport accounting for at least 0.05% but less than 0.25% of annual enplanements in the United States (U.S.DOT definition).

Stakeholder	A person, group, or organization that has interest or concern in the IROPS planning or response.
Stranded Passenger Plan	An airport plan that outlines processes for the airport and airline to coordinate in order to deplane passengers from an aircraft on the tarmac and/or provide amenities to passengers during an extended delay while stranded on an aircraft or in a terminal.
Surge	A spike in demand or activity (airside and/or landside) caused by an IROPS event, usually involving aircraft and passengers flowing into an airport.
Tarmac Delay	Holding an aircraft on the ground beyond its schedule, either before take-off or after landing.
Trigger Event	A specific event that leads to the initiation of response activities. A trigger event normally is a warning cue that personnel should begin preparations to deal with IROPS to mitigate effects on passengers. Ideally, each aviation service provider will have established trigger events and associated decision-making criteria to determine the timing and scale of their response efforts. Response efforts to a given trigger can involve multiple aviation service providers based on the determined scale of the necessary response. The information that decision makers rely on often comes from multiple aviation service providers. As a result, collaboration across aviation service responders is important to foster well-informed decision making and well-defined response efforts.
U.S.DOT National Task Force to Develop Model Contingency Plans to Deal with Lengthy Airline On-Board Ground Delays	A temporary organization of individuals appointed by the Secretary of Transportation to study and develop recommendations for meeting customer needs. In November 2008, the task force released its recommendations in a document titled Development of Contingency Plans for Lengthy Airline On-Board Ground Delays.

APPENDIX A

Before an IROPS Event

The following information and checklists are useful for preparing for an IROPS event:

Appendix A.1	Fundamentals of IROPS Planning (from *ACRP Report 65: Guidebook for Airport Irregular Operations [IROPS] Contingency Planning*)
Appendix A.2	Extract of U.S.DOT Regulations Related to Airports and Air Carriers (Domestic and Foreign)
Appendix A.3	Expanded List of Stakeholders and Stakeholder Group Communication Matrix
Appendix A.4	Checklist for Maintaining a Stakeholder Contact List
Appendix A.5	Expanded Template for Stakeholder Contact Details
Appendix A.6	Data Resources
Appendix A.7	Annual IROPS Checklist
Appendix A.8	Case Studies and U.S.DOT Aviation Enforcement Order Summaries
Appendix A.9	Sample Tabletop Exercise Scenarios, Considerations, and Planning Guide

Accessing Resources Mentioned in Appendix A.1

Appendix A.1 in *ACRP Report 153* presents content originally published in *ACRP Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning*—Part 1. This appendix includes numerous references to resources and tools from *ACRP Report 65*—Part 2, specifically Resource A—Topics for IROPS Plan Development; Resource B—Model IROPS Contingency Plan; and Resource C—Tools.

ACRP Report 65—Part 2, is not reprinted in this guidebook. For readers' convenience, however, interactive Microsoft Word files containing this material (Resources A, B, and C) are provided in conjunction with the other files on **CRP-CD 180. Appendix A.1** has been edited to reflect the files' availability on the CD. Edited wording is identified by underlining.

The complete original *ACRP Report 65* can be ordered in print form or downloaded in PDF format by accessing http://www.trb.org and searching "ACRP Report 65".

Appendix A.1 Fundamentals of IROPS Planning (from *ACRP Report 65: Guidebook for Airport Irregular Operations [IROPS] Contingency Planning*)

INTRODUCTION

Why do we need a guidebook?

Since aircraft began to fly and carry passengers for hire, there has always been the potential for delays; however, today with the vast number of passengers, airlines and economic and physical constraints placed on the aviation system, the potential for significant delays has never been greater. Over the past ten years, the issue of tarmac delays and related Irregular Operations (IROPS) events has really pushed concern to the forefront of our industry. Passengers and politicians alike are demanding that these issues be addressed. This has prompted ideas like a passenger bill of rights to emerge as well as several U.S.DOT rules in order to protect passenger needs during these delays.

The United States Department of Transportation (DOT) recently made changes to its rules concerning the requirement for air carriers to coordinate their Tarmac Delay Contingency Plans directly with airports. While these changes apply only to airlines, your airport's participation in the response efforts of airlines is crucial to helping prevent the types of Irregular Operations (IROPS) incidents that have happened in the past and that have resulted in significant passenger harm and public relations nightmares for airports.

Negative impacts to passengers have been considerably reduced at airports that have developed and implemented their own comprehensive, coordinated plan for dealing with IROPS situations. Participation by airport operators involves a variety of areas, including facilitating communication and providing facilities as well as services to support airline response efforts.

Your airport's IROPS contingency plan will ensure that your support efforts are properly aligned with response efforts of the Federal Aviation Administration (FAA), Transportation Security Administration (TSA), Customs and Border Protection (CBP), and airlines, and that the airport community's goal of mitigating the hardships on passengers during IROPS situations is realized. Please note that for the purposes of this guidebook, references to the FAA include all forms of air traffic control (ATC) services.

For the purposes of this document, the term "IROPS" is intended to describe those exceptional events that require actions and/or capabilities beyond those considered usual by aviation service providers. An example of these events is the occurrence of too many unexpected aircraft at an airport causing unique staffing and resource needs by both the airport and passengers. Additionally, any references to an IROPS contingency plan will be referred to as an "IROPS contingency plan," an "IROPS response plan," or an "IROPS plan."

How does this guidebook meet the need?

The objective of ACRP Project 10-10, "Guidebook for Airport Irregular Operations (IROPS) Contingency Planning," was to prepare a practical airport IROPS response planning document for commercial passenger service airports of all sizes to improve customer service during times of adverse weather and unplanned conditions. The findings were published as *ACRP Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning*.

ACRP Report 65 provides focus on responses to situations that involve:

- Tarmac delays
- Passenger surges in terminals and security areas
- Terminal passenger capacity
- Off-hour conditions related to staffing for key areas such as access through security and staffing for TSA and CBP functions, as well as for concessions
- Passenger conditions during extended stays, both in terminals and off-site
- Planning for special needs passengers

Users of this guidebook are given step-by-step instructions on how to prepare and/or refine their IROPS plans. The flexibility of the guidebook material enables airports to either make improvements to existing IROPS plans or create a completely new plan, and it is scalable to relate to large, medium, and small airports. *ACRP Report 65* focuses on collaboration and coordination to ensure that customer needs are met.

ACRP Report 65 draws from the United States DOT *Model Plan for Lengthy Airline Onboard Ground Delays*, created by its national task force. However, additional research was performed by the ACRP Project 10-10 team to round out the guidebook, including:

- Administering a survey that addresses IROPS planning, events, and concerns at 400+ airports
- Assessing summary material from airport IROPS response workshops held across the nation, independent of this research project
- Hosting focus groups and site visits
- Assessing IROPS response planning requirements
- Identifying examples of IROPS response planning best practices from airports around the country

Figure 1 illustrates the sequence of events related to IROPS contingency planning five years prior to the publication of *ACRP Report 65*.

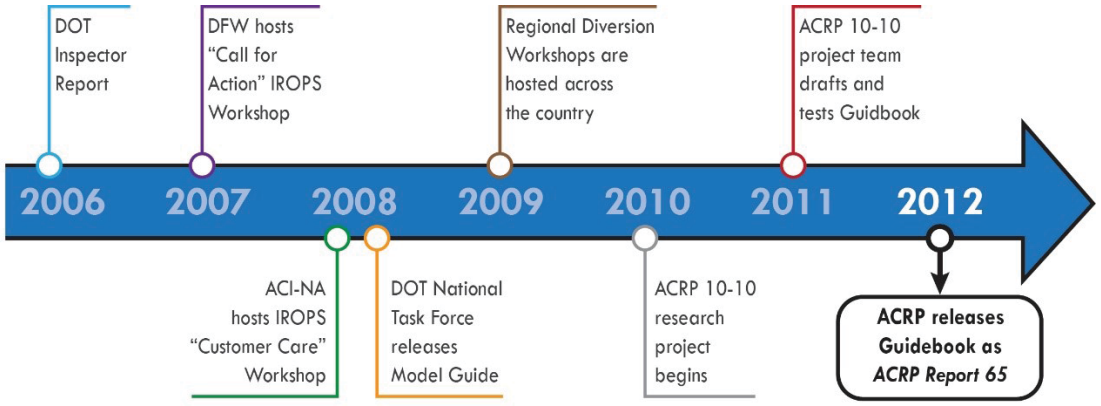


Figure 1. Timeline of IROPS Planning Initiatives.

Who can use the guidebook?

The guidance presented in this appendix can be used by commercial passenger service airports of all sizes to develop, continually evaluate, and/or update their IROPS plans for procedures pertaining to IROPS.

Throughout **Appendix A.1,** icons direct readers to additional resources available:

Topics = This icon highlights topics that can be found in *ACRP Report 65* – Part 2 – Resource A – Topics for IROPS Plan Development, available on CRP-CD 180.

Tools = This icon highlights tools that can be found in *ACRP Report 65* – Part 2 – Resource C – Tools, available on CRP-CD 180.

Airports that do not have an existing IROPS plan should consider using Resource A – Topics for IROPS Plan Development to assist in the development of an initial draft IROPS plan for their airport. Airports that do have an existing IROPS plan should use the topics in Resource A to guide an evaluation review and/or update of their plan as needed. Resource C contains tools that can be used by airports in either case to strengthen their IROPS planning efforts. In either instance, the use of a local IROPS Champion (described below) is recommended in implementation of the review and development process.

Role of the IROPS Champion and partnering for success

During the development of *ACRP Report 65*, one message emerged as being common to all successful IROPS contingency response efforts. That message is simple, but critically important: communicate - communicate - communicate. In applying this guidebook, this means bringing aviation service provider organizations (listed in **Figure 2**) together so they can explore ways to support one another to address current and evolving aviation challenges that disrupt the normal flow of passengers through the air transportation system.

Aviation Service Providers

- Airport Operations
- Airlines
- Government Agencies (FAA, CBP, TSA)
- Concessionaires
- Ground Transportation Agencies
- Fixed Base Operators (FBOs)
- Overnight Accommodations
- Emergency Response Providers
- Military (if joint-use facility)
- Diversion Airports

Figure 2. Aviation Service Providers.

To best use this guidebook, it is recommended that airport management identify a point person, known as the IROPS Champion, who will be responsible for carrying out all of the necessary tasks, coordinating efforts between all service providers involved in IROPS events, and developing a partnering environment. (**Figure 3** outlines the responsibilities of the IROPS Champion.) This person may be the airport manager, or in some instances it may be another management or operations staff member. If an IROPS Champion is utilized, it is imperative that the airport manager exhibit support to the IROPS Champion so the aviation service providers involved in the development and implementation of

the IROPS plan know the IROPS Champion is empowered to develop the plan. (**Figure 4** illustrates the relationship between airport management, the IROPS Champion, and aviation service providers.)

- Read this appendix, from ***ACRP Report 65* – Part 1 – Fundamentals of IROPS Planning**, and access resources from ***ACRP Report 65* – Part 2 – Resources,** available on **CRP-CD 180.**
- Distribute Topic Worksheets to appropriate service providers (**Resource A**).
- Collect worksheets.
- Input worksheet data into Model IROPS Plan (**Resource B**).
- Distribute completed coordinated IROPS plan to appropriate service providers.
- Update IROPS plan as needed.

Figure 3. IROPS Champion Responsibilities.

Figure 4. Relationship between Airport Management, the IROPS Champion, and Aviation Service Providers.

One of the most important responsibilities of the IROPS Champion is to encourage communication, coordination, and collaboration between service providers at an airport. In order to provide mutual support and focus on cooperation, service providers must first find a way to bridge the gap between feeling that they need to go it alone with individual plans and reach an environment of partnering for success to develop a collaborative regional contingency plan to provide a coordinated response to IROPS events. This can be accomplished by taking attitudes such as those listed in **Figure 5** on the left and converting them to those on the right.

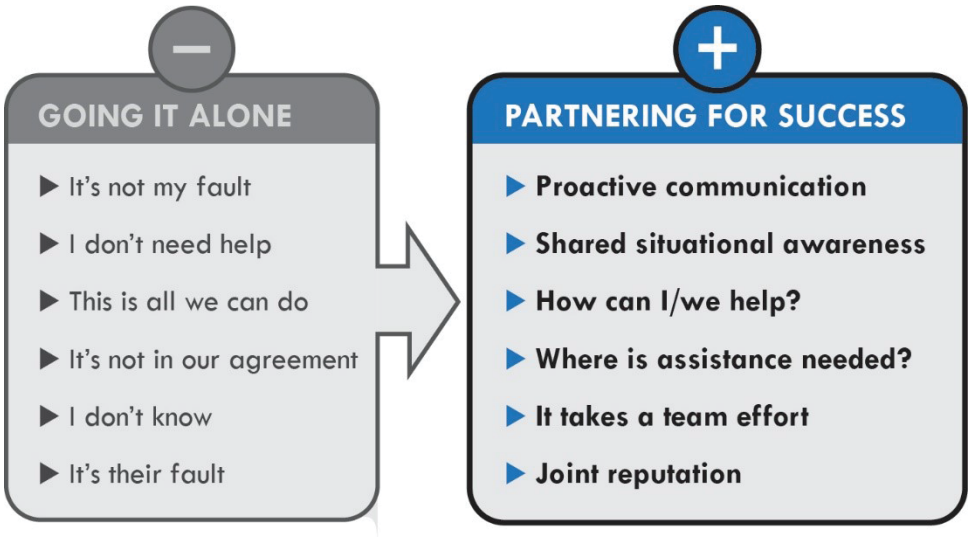


Figure 5. Partnering for Success.

Process for developing an IROPS Response Plan

The guidebook recommends starting your airport's IROPS response planning immediately. Advanced planning is necessary to establish local agreements for cooperation and collaboration between various aviation service providers before potential IROPS events occur. Suggested IROPS planning steps to achieve cooperation and collaboration are provided in **Figure 6**.

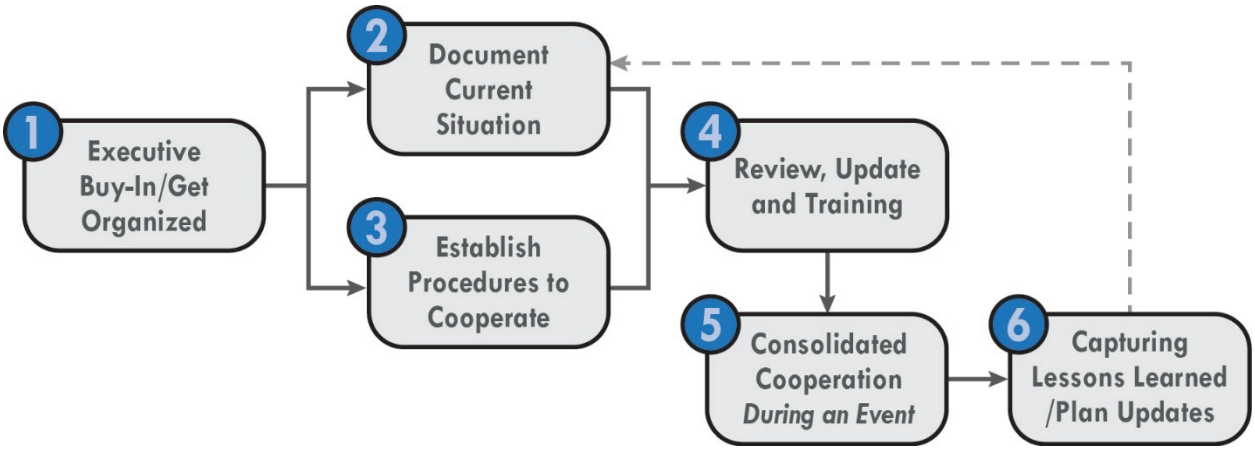


Figure 6. IROPS Planning Steps.

See Tool 1 – IROPS Planning Process and Tool 2 – DFW's Sample for Partnering for Success, both in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

How does an airport IROPS contingency plan relate to an Airport Emergency Plan (AEP) or National Incident Management System (NIMS) protocol?

An AEP contains information describing how an airport plans for response to a variety of emergency situations. A significant portion of the AEP planning information and response procedures will be similar to airport IROPS procedures. Many of the same organizations will be involved in an airport's coordinated IROPS response strategy, and many of its communication procedures will be similar. Although the two plans are alike, it is important to consider the requirements of each plan separately during the planning process.

The NIMS is used across the United States, and most emergency management personnel have been trained on the use and usefulness of this system when needed. Setting up the airport's Emergency Operations Center (EOC) with its inherent NIMS procedures to deal with IROPS is a decision that will need to be made on a case-by-case basis by airport personnel in charge during an IROPS event. For minor or short duration IROPS events it is not likely that an EOC would need to be set up; however, as the magnitude or the duration of the event is extended, establishing the EOC may be necessary to coordinate the activities of all of the service providers.

CHAPTER 1 – EXECUTIVE BUY-IN/GET ORGANIZED

1.1 Description

The first step, whether your airport is developing a new plan or reviewing an existing one, is to establish executive buy-in from your airport and each of your local aviation service provider organizations. These should include airport operations, airlines, concessions, ground transportation, local accommodations, government agencies (FAA, CBP, and TSA), fixed base operators (FBOs), refuelers, military (if a joint-use facility), executive management liaison, and emergency response.

Next, your airport should create an IROPS Contingency Response Committee that includes representatives from each of your local service providers. The Committee should be led by an IROPS Chairperson, who typically is a representative of your airport. The goal of your airport's Committee will be to establish and enhance contingency plans for local service providers through their collective, cooperative, and collaborative decision making.

1.2 Creating Executive Buy-In

Two elements to executive buy-in must be in place for a successful IROPS plan. The first element is the airport itself. Executive management of the airport must have a firm commitment to develop, implement, and continually improve an IROPS plan that illustrates a full buy-in from the top down within the airport staff. The second element is equivalent buy-in from the executive management of the various aviation service providers. Executive buy-in is fully accomplished when each of the airport aviation service provider organizations has committed their support of a documented, coordinated IROPS plan.

1.3 Identifying the IROPS Champion

Before organizational activities can take place, an IROPS Champion must be selected and empowered by airport management. The IROPS Champion is the point person for all activities related to developing an IROPS plan. An airport management employee is often well suited/positioned to be the IROPS Champion; he/she has holistic responsibilities for airport operations, and many times sits in a role that can effectively facilitate bringing aviation service providers together. The activities discussed throughout this guidebook will be led by the IROPS Champion and supported by the airport IROPS Contingency Response Committee.

1.4 Establishing an IROPS Contingency Response Committee

The goal of the airport IROPS Contingency Response Committee is to establish and enhance contingency plans through their collective, cooperative, and collaborative decision making. This will ensure that actions result in a coordinated and unified level of customer care across all of the airport's aviation service providers during IROPS events.

It is essential that all local service providers not only develop their own individual IROPS plans, but also participate in the airport's IROPS Contingency Response Committee activities. Members of an airport IROPS Contingency Response Committee should include representatives of all local aviation service provider organizations.

See Tool 3 – Responsibilities of the Airport's IROPS Contingency Response Committee and Tool 4 – Questions for Initial IROPS Committee Meeting, both in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

1.5 Notification and Contact Lists

An important recommendation for IROPS Contingency Response Committee action includes determination and documentation of local methods for 24/7 communications. The contact list should be valid for both normal and off-hour operations. Key point-of-contact information for the airport should be shared with all local air carriers and government agencies. As with other similar information, procedures must be established to keep the information accurate and up to date. These contact lists and notification procedures should be developed and communicated with all service providers.

For instance, an airport should create a 24/7 email contact list of major airport stakeholders, including diversion airports, in a region. This list should be used to communicate status and track diverted flights in the region during IROPS events to ensure shared situational awareness. Notification methods should be discussed by the IROPS Contingency Response Committee and chosen based on the most reliable methods for reaching all service providers on an airport's IROPS contact list. Various methods can include:

- Email distribution
- Text messaging
- Phone tree
- Conference calls
- Notification/decision tree

Based on research completed for this guidebook, it is recommended that hub airports host a conference call with predetermined key service providers at least 24 to 48 hours prior to a severe weather event that has been forecasted to facilitate communications and coordination. Representatives from the following service providers should be included on this call: National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS), FAA, airlines, CBP, TSA, and airport departments.

Recommended guidance is provided in Topic 1: IROPS Contingency Response Committee, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

CHAPTER 2 – DOCUMENT CURRENT SITUATION

2.1 Description

In this step, your airport's IROPS Contingency Response Committee should identify, gather, and compare important response plan information from service providers to ensure collaboration and cooperation. The collective comparison of current IROPS plans between service providers should include a review of local IROPS events history, identification of customer needs, evaluation of how to track delayed aircraft, the tracking of equipment inventory, and the determination of skills availability. Key airport implementation should include maintaining and sharing local contact and email distribution lists.

2.2 Reviewing Existing IROPS Response Plans

It is recognized that each service provider should have its own plans for response to IROPS events. It is also recognized that the United States DOT's rules on enhancing airline passenger protections (14 CFR Part 259 *Enhanced Protections for Airline Passengers*) require air carriers to adopt tarmac delay contingency plans and coordinate those plans with airports at which they operate. Therefore, the purpose of this activity by the IROPS Contingency Response Committee is to identify and gather important response plan information from service providers to ensure that proper communication, cooperation, and coordination occurs between them. Results of this review should include both formal and informal understandings of coordination between these organizations.

These response plans from individual organizations should be evaluated for adequacy during the four categories of IROPS impact situations: *surge, capacity, after-hours, and extended-stay* (see Section 2.3 for more information on these scenarios). Each of these situations should be considered for impacts involving unplanned aircraft and unplanned passengers. For example, planning for off-hours situations involving both aircraft and passengers should consider the following:

- Unplanned aircraft arrivals
- The ability to meet passenger needs such as concessions
- Staff access to secure side
- The availability of CBP and TSA staffing

Recommended guidance is provided in Topic 2a: Reviewing Existing IROPS Response Plans, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

See Tool 5 – Implementation Checklist for Evaluating IROPS Plans and Tool 6 – Self-Assessment Questionnaire, both in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

2.3 Reviewing Local IROPS Events and Assessing Local Situation

What causes an IROPS event?

Causes of IROPS events can include extreme weather, natural disasters, reduction of airport facility capacity, aircraft mechanical problems, labor issues, and others.

What are the potential impacts of an IROPS event?

In addition to impacts on passengers, IROPS events can also have an impact on airlines and airports, as shown in **Figure 7**. The impacts of IROPS events on airlines include flight delays, cancellations, diversions (including non-scheduled airline flights), and crew time expiration, resulting in potentially adverse impacts on passengers and other airport customers.

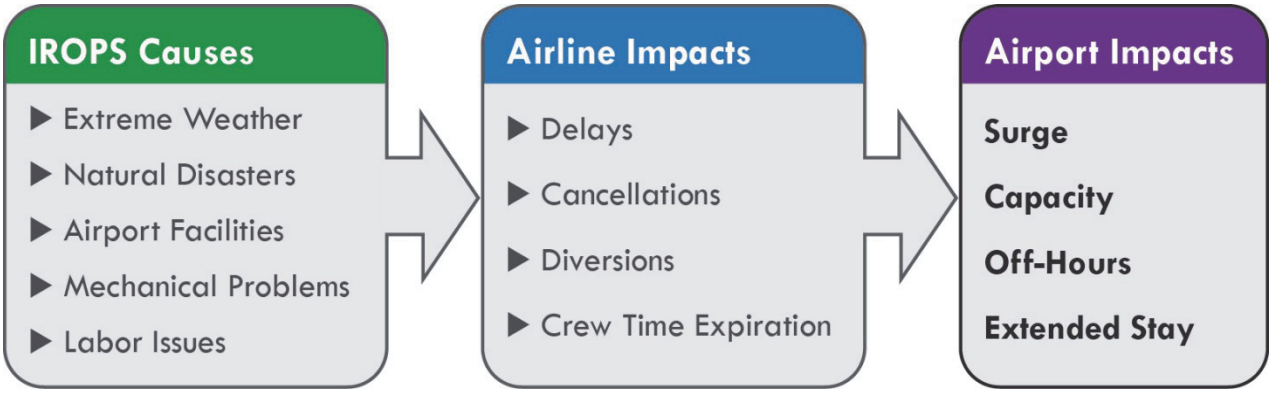


Figure 7. Impacts of IROPS Events.

Airport impacts from unscheduled passengers and aircraft can be categorized into four scenarios that must be planned for:

- Surge: Aircraft and passengers flowing into an airport
- Capacity: Airport terminal becomes filled with passengers and ramp space/gates become full with aircraft
- After-Hours: Aircraft land and passengers need to deplane at irregular hours
- Extended Stay: Passengers and aircraft may be stuck at airport for an extended period of time (Extended stays may result from a variety of IROPS situations.)

(Note: extended delays are impacts on flight schedules that typically affect airlines and may affect airport resources, but that may or may not involve passengers or result in extended stays.)

Recommended guidance is provided in Topic 2b: IROPS Event History, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

2.4 Passenger Needs

Needs of passengers (including animals) on board aircraft on the ground and in airport terminals during lengthy delays vary, and normally require the attention of more than one party. There are five areas of need for passengers including up-to-date information, food and water, safe and secure facilities (including clean restrooms on board an aircraft and in an airport terminal), special services (including services for special needs passengers and ground transportation), and lodging for extended stays. Significant disruptions to airline schedules or operations can adversely impact the passenger experience and their overall satisfaction with the air transportation system. **Figure 8** illustrates the needs of passengers (including live cargo) during IROPS events.

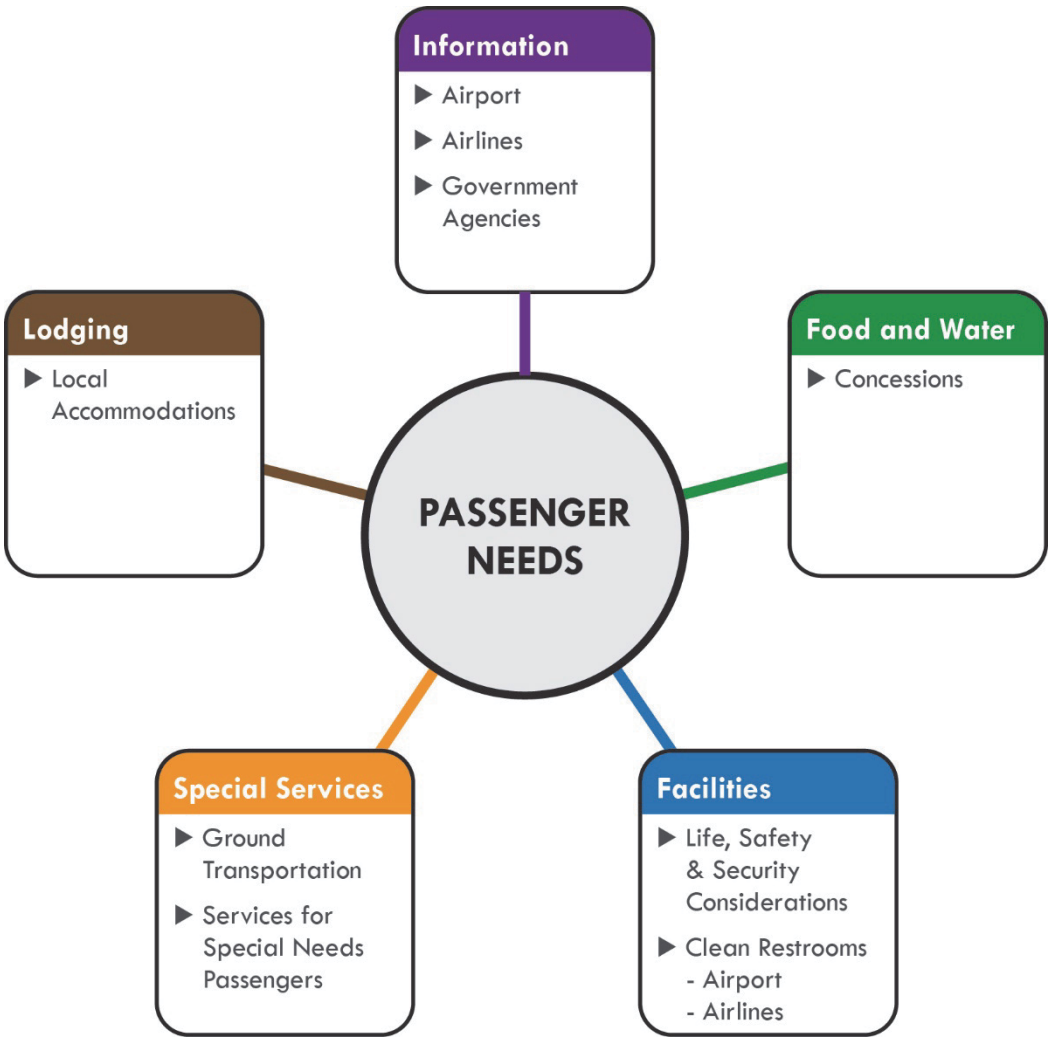


Figure 8. Passenger Needs.

Recommended guidance is provided in Topic 2c: Passenger Needs, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

2.5 Current Response Capabilities

A number of questions related to several key concepts should be considered when beginning the planning process. Please note the following questions are generic and additional guidance can be found in Resource A – Topics for IROPS plan Development and Resource C - Tools:

- Availability of services during an IROPS event
  - What does an airport have in place to know when an aircraft is experiencing an IROPS event at its location?
  - What are an airport's goals for providing service to passengers and other customers during an event?
  - What contingency response procedures does an airport have in place to achieve these goals?
  - How is an airport's IROPS response service coordinated with other local service providers?

- Coordination of services during an IROPS event
  - What challenges exist at an airport when an IROPS contingency response requires coordination between two or more service providers?
  - Are there different types of challenges at an airport during an IROPS event depending on whether it is a departure or arrival?
  - What steps could be taken to improve the availability of service provided by an airport?

- Pre-position of resources required during an IROPS event
  - What resources are required?
  - What are the arrangements/procedures for shared resources when needed?
  - What steps have been taken to ensure passenger's needs are met during extended stays in the terminal?

- Sharing situational information during an IROPS event
  - What type of information is being shared at an airport during an IROPS event?
  - What is the mechanism by which information is shared?
  - How is the shared information used by each of the receiving service providers?
  - What additional shared information would be useful?
  - What coordination procedures exist for service providers to back up each other during an extended-delay, diversion, or special mobility event?
  - What is the procedure to report the effectiveness of the response to meeting passenger needs during an event by each service provider, individually and collectively, to establish lessons learned and improve response?

Recommended guidance is provided in:
Topic 2d: Tracking Delayed Aircraft,
Topic 2e: Trigger Events and Communications Plans,
Topic 2f: Support for Passengers,
Topic 2g: Tracking Resource Inventory, and
Topic 2h: Skills Availability, all in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

See Tool 7 – Example Resource Inventory Checklist in Resource C, in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

CHAPTER 3 – ESTABLISH PROCEDURES TO COOPERATE

3.1 Description

In this step, your airport will need to determine how to establish cooperation with local service providers in order to meet passenger needs. These include airlines, concessions, ground transportation, and government agencies (FAA, TSA, and CBP) as related to their staffing and resource capabilities. Cooperation is needed for responding to after-hours operation, surge in the number of passengers in the terminal and/or needing transportation to local accommodations, and consideration for diverted flights, including international flights into airports without a CBP presence. Every airport should establish a local process to monitor and maintain its overall airport capacity status during an evolving IROPS event.

3.2 Cooperation Procedures

Cooperation procedures are needed for coordinated response to:

- After-hours operation
- Surge in number of passengers in terminal and/or needing transportation to local accommodations
- Other impacts on passenger service caused by lengthy flight delays
- Consideration for diverted flights, including international flights to airports without a permanent CBP presence

Every airport should establish a local process to monitor and maintain its overall airport capacity status during an evolving IROPS event. This can involve keeping an inventory of data pertaining to IROPS events that will assist and support the acquisition of and/or justification for additional resources and equipment.

A group of service providers typically found at airports is vital in local IROPS planning efforts: airlines, concessions, ground transportation, FAA, TSA, and CBP. Coordination with each of these entities is critical in establishing coordinated procedures that will be followed during an IROPS event. Above and beyond these service providers, other service providers should be coordinated with as appropriate to your airport (e.g., overnight accommodations, FBOs, alternate transportation providers).

Recommended guidance is provided in:
Topic 3a: Establish Procedures with Airlines,
Topic 3b: Establish Procedures with FAA,
Topic 3c: Establish Procedures with CBP,
Topic 3d: Establish Procedures with TSA,
Topic 3e: Establish Procedures with Concessions, and
Topic 3f: Establish Procedures with Ground Transportation, all in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

See Tool 8 – Concessions Checklist for Snow and Hurricane Events and Tool 9 – Airport-Airline 24/7 Contact and Capability Summary, both in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

3.3 Technology Considerations

A wide variety of technologies can assist in implementing IROPS response plans. It is recommended that an airport try to leverage existing technology before developing new unique systems. Assessments of technology solutions related to effective management of related IROPS contingency response activities are provided in Resource C - Tools of this guidebook. Also provided is a comparison of technology categories by applications and relative cost.

See Tool 10 – Technology Solutions, in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

CHAPTER 4 – REVIEW, UPDATE, AND TRAINING

4.1 Description

In this step, your airport should determine what improved procedures are necessary and beneficial to IROPS planning, and then should conduct coordinated training exercises to ensure these plans are understood by all involved service providers. Table top exercises are recommended to utilize considerations of both local IROPS events and events involving other regional airports. A key element of these exercises should be testing for impacts from each of the four IROPS situation types (*surge, capacity, off-hours,* and *extended-stay*).

4.2 Periodic Review

After reviewing the existing local IROPS plans (as described in Section 2.2) and establishing procedures to cooperate (as described in Chapter 3) it is important to review how well the current plans address potential IROPS impacts. Specific attention should be paid when these response plans from individual organizations are evaluated for adequacy during the four categories of IROPS impact situations (discussed previously). Each of these unplanned situations should be considered for impacts involving both aircraft and passengers.

4.3 Update

Individual organization response plans should be updated and/or supplemented based on answers to the questions from the review process. Coordinated plans with local service providers (as described in Section 3.2) should also be reviewed and updated and/or supplemented at this time if needed.

4.4 Training

Training exercises should be developed and implemented to emphasize the updated response plans. After determining what improved procedures are necessary and beneficial to IROPS planning, it is important for the airport to support communication, cooperation, and coordination between service providers through workshops and training initiatives. This will ensure that new procedures are understood by all involved service providers.

The primary purpose of holding periodic IROPS coordination workshops is to provide a common format and venue for the periodic review and the confirmation and updating of local IROPS plans. It is recommended that these workshops be held biannually, including one during the fall/winter season and one during the spring/summer season. The goals of these local workshops are to:

- Expedite and facilitate the development of the local IROPS community
- Establish a communication plan
- Develop and integrate IROPS plans
- Encourage agreement to execute the IROPS plan
- Provide general orientation to explain why planning for mitigating the effects of IROPS events on passengers is critical

Attendance should include representatives from all organizations with representation on the airport's IROPS Contingency Response Committee and also representatives of other key airport personnel based on the importance of their understanding of IROPS planning. Additionally, other regional service providers should be invited to participate as appropriate.

Periodic coordinated frontline training for airport contingency response should be conducted to provide an emphasis on actions requiring coordination of two or more organizations and to provide an opportunity to test new policies, practices, and procedures. Contingency training exercises should focus on shared situational awareness in relation to:

- Mutual support and valuing one another
- Timing of IROPS responses
- Effectiveness of responses
- Shared success
- Impacts of the United States DOT "3-Hour Rule" and "4-Hour Rule" (see Glossary for definitions of these rules)

Table top exercises are recommended to utilize considerations of both local IROPS events and events involving other regional airports. A key element of these exercises should be testing for impacts from each of the four IROPS situation types (*surge, capacity, off-hours,* and *extended-stay*).

Recommended guidance is provided in:
Topic 4a: IROPS Coordination Workshops, and
Topic 4b: IROPS Coordinated Frontline Training, both in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

See Tool 11 – Sample Workshop Agenda, in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

CHAPTER 5 – CONSOLIDATED COOPERATION ACTIONS DURING AN EVENT

5.1 Description

When your airport is experiencing an IROPS event, three actions are critical: *communication, coordination*, and *collaboration*. This requires your local service providers to work together to communicate aircraft status in the air and on the ground, as well as execute IROPS procedures as shown in **Figure 9**. In this step, your airport IROPS Contingency Response Committee needs to ensure the capability for coordinating shared information for both aircraft status and airport capacity. Relevant aspects of aircraft status should be provided to appropriate aviation service provider organizations during an IROPS event by the airport's communication center or point of contact.

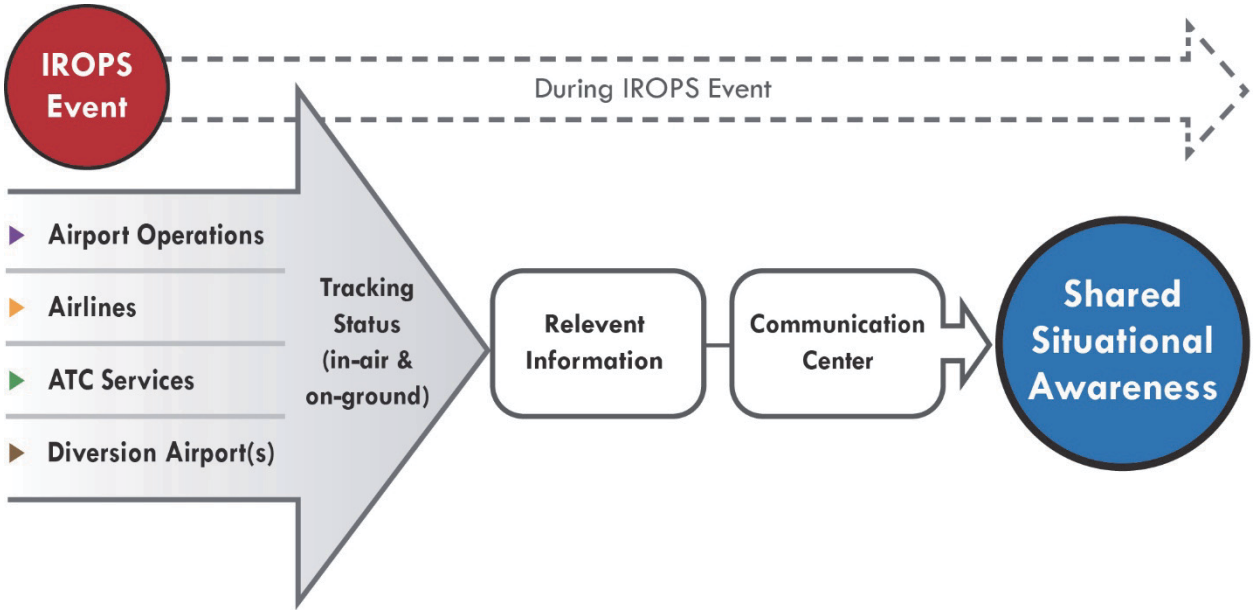


Figure 9. Joint Actions during IROPS Events.

5.2 Monitoring IROPS Event Indicators

While some IROPS events are unpredictable, many can be handled successfully if service providers are actively anticipating an event. Certain actions taken by service providers on a constant basis can position them well to handle an IROPS event, should one occur. Some examples of these actions include tracking aircraft status and tracking weather patterns.

Aircraft status in the air and on the ground is tracked by airlines and the FAA to provide accurate, complete, and timely information regarding expected flight delays and developing local situations.

Recommended guidance is provided in Topic 5a: Aircraft Status, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

Weather patterns are tracked by the airport, airlines, and the FAA to predict potential impacts to aircraft operations, as well as to carry out alternate operating procedures, such as diverting flights to alternate airports. This is done to maintain the safety of the crew and passengers, as well as operations staff out on the airfield.

Recommended guidance is provided in Topic 5b: Tracking Weather, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

See Tool 12 –National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) Checklist in Resource C, in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

A main objective during any type of IROPS event is for all service providers to focus on ensuring an international flight gets to its scheduled arrival airport. If this objective cannot be met, then the focus should be to divert it to a CBP staffed airport with appropriate international aircraft equipment.

5.3 Executing IROPS Response Plans and Procedures

Effective response to an evolving IROPS event depends on timely shared situational awareness among all aviation service providers. This awareness includes the early identification of a potential IROPS situation and the evolving IROPS condition as the event advances. Specifically, this involves the sharing of the following:

- Tracking and sharing aircraft status both in-air and on the ground
- Passenger needs
- Capacity constraints
- After-hour capabilities, if warranted

IROPS communication plans

A key benefit of IROPS communication plans include coordinated IROPS response actions by airport operations, the airlines, ATC services, and by affected diversion airports. Based on the situational need, additional communications among other organizations including TSA, CBP, concessions, and ground transportation may also be required. In addition to internal communication, efforts should be made to communicate externally with customers and passengers through airport websites and social media outlets where appropriate.

Recommended guidance is provided in Topic 5c: Execute IROPS Communication Plans, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

See Tool 13 – Sample Communication Plan and Tool 14 – Social Media, both in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

Passenger support plans

The key goal of an IROPS plan is to ensure focus on coordinated support of passengers and other customers during an IROPS event. Guidance for planning and developing support capabilities and actions is based on aircraft and passenger location and on duration of passenger stay both on board aircraft and in the terminal.

Recommended guidance is provided in Topic 5d: Execute Passenger Support Plans, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

Airlines

Per the United States DOT rules on enhancing airline passenger protections (14 CFR Part 259 *Enhanced Protections for Airline Passengers*), airlines are required to develop and coordinate their extended-delay contingency plans with both the scheduled airports they serve and their diversion airports. It is recommended that the airline contingency plans be fully discussed and understood by your airport so that they can be implemented when needed during IROPS events.

Recommended guidance is provided in Topic 5e: Execute IROPS Procedures with Airlines, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

FAA, TSA, CBP

Each of the listed government agencies has established guidelines covering their responsibilities during an IROPS event. These include provisions for coordination with airports during their local IROPS contingency planning efforts. These guidelines include the following:

- The FAA has agreed to implement aircraft ground control procedures for aircraft making tarmac delay requests per DOT rules on enhancing airline passenger protections. Additionally the FAA currently provides procedures for airport access in regard to expected flight delays and developing local situations. These flight-status-related sources are provided as long as they do not interfere with normal FAA operations.

- The Department of Homeland Security has issued procedures to TSA Federal Security Directors establishing and utilizing secure areas using procedures in the Airport Security Program or Aircraft Operator Standard Security Program. The TSA organization at local airports should be contacted as needed to implement appropriate security measures for passengers during IROPS events.

- The Department of Homeland Security through the CBP Office of Field Operation has developed a contingency plan to address unscheduled arrivals, including flight diversions and technical fuel stops. The Director of Field Operations has provided guidance for IROPS events, including recommended response procedures for international flights diverted to airports without a Federal Inspection Station. Additional CBP procedures

have been established with consideration of United States DOT regulations covering extended ground delays (3- and 4-hour guidelines for domestic and international flights, respectively).

Recommended guidance is provided in:
Topic 5f: Execute IROPS Procedures with FAA,
Topic 5g: Execute IROPS Procedures with CBP, and
Topic 5h: Execute IROPS Procedures with TSA, all in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

Concessions

The role of concessions during an IROPS event is to ensure that passenger food and beverage needs (and potentially medicinal and family needs) are met during IROPS events. It is recommended that concessions develop and implement their own IROPS plans for operations to be used during IROPS events. The IROPS operation plans for concessions should be activated as required following situational notification by either an airline or by an airport designated point-of-contact.

Recommended guidance is provided in Topic 5i: Execute IROPS Concessions Procedures, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

Ground Transportation

The role of ground transportation during an IROPS event is to ensure that needs (including those resulting in extended passenger and customer stays in the terminal area) can be supported. It is recommended that ground transportation organizations develop and implement their own IROPS plans for use during IROPS events. Ground transportation organizations should activate their IROPS plans when notified of related requirements caused by an IROPS event.

Recommended guidance is provided in Topic 5j: Execute IROPS Ground Transportation Procedures, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

See Tool 15 – During an Event Tools and Tool 16 – Diversion Checklist, both in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

CHAPTER 6 – CAPTURE LESSONS LEARNED AND UPDATING PLANS

6.1 Description

In this step, your airport should host an after-action meeting to review performance effectiveness as soon as is practical following return of operations to a normal state after an IROPS event. Part of the recommended debriefing procedures should be the identification of lessons learned. The airport IROPS response planning documentation should be reviewed by the IROPS Contingency Response Committee and updated as appropriate.

6.2 Debrief after an IROPS Event

The purpose of the debriefing session is to review each airport organization's response performance following a major IROPS event. This allows service provider organizations to assess and analyze all aspects of response, to document lessons learned, and to improve performance by sustaining strengths and correcting weaknesses.

When necessary, performance improvements should be incorporated into the IROPS plan with staff provided training on any new procedures. Additionally, technology and resources should be evaluated as part of the review to determine if either should be enhanced to assist in improving IROPS event response. Debriefings should cover the following:

- Communication issues
- Procedures refinement
- Service failures and lapses
- After-hour staffing resources and gaps
- Operations and maintenance restocking (deicing fluid, concessions, and other)
- Capability needs
- New capital items requisitions

Recommended guidance is provided in Topic 6a: Debriefing IROPS Event, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

See Tool 17 – After an Event Debrief, in *ACRP Report 65* – Part 2 – Resources (Resource C), available on CRP-CD 180.

6.3 Lessons Learned

The primary purpose of gathering lessons learned following an IROPS event is to document what worked and what did not. Lessons learned, both good and bad, should be expected to surface from debriefing meetings held after every major IROPS event.

Following internal management debriefings, each service provider organization should report a summary of its findings (including any lessons learned) and recommendations to the IROPS Champion. The IROPS Contingency Response Committee should consider the several debriefing reports typically expected from each major IROPS event to identify any additional lessons learned that recognize tasks to be performed and the responsible party to perform them. The Committee should track implementation and hold subsequent meetings to confirm completion of the tasks. The IROPS Committee should compile and distribute any resulting new lessons learned to local airport organizations that may be affected. Periodically, a summary of local lessons learned should be shared with other airports in the aviation community.

Recommended guidance is provided in Topic 6b: Capturing Lessons Learned, in *ACRP Report 65* – Part 2 – Resources (Resource A), available on CRP-CD 180.

SUMMARY

Developing and implementing an effective airport IROPS plan requires continuous communication, cooperation, and coordination between the airport and each of the local service providers.
Activities associated with the six steps of IROPS plan development process are: know, act, confirm, and improve. Each activity is critical to provide a unified response by all service providers during IROPS events.

- **KNOW:** *What do we need to accomplish?*
  - Step 1 - Executive Buy-In/Get Organized
  - Step 2 - Document Current Situation

- **ACT**: *How do we partner for success?*
  - Step 3 - Establish Procedures to Cooperate
  - Step 4 - Review, Update, and Training for Plan Implementation

- **CONFIRM:** *Did we do what we said?*
  - Step 5 - Consolidated Cooperation During an Event

- **IMPROVE:** *Are we communicating our lessons learned to continually advance our response to IROPS events?*
  - Step 6 - Capture Lessons Learned and Updating Plans

Continually updating and refining an airport's IROPS plan helps to provide the best customer experience for passengers affected by IROPS events.

The most important things to remember for successful IROPS contingency responses are:

(1) Success is measured by passenger experience.
(2) Success requires top-down commitment of executive management.
(3) Success hinges on the ability to communicate-communicate-communicate.

Appendix A.2 Extract of U.S.DOT Regulations Related to Airports and Air Carriers (Domestic and Foreign)

This appendix includes answers to frequently asked questions concerning the enforcement of the second final rule on Enhancing Airline Passenger Protections (EAPP #2). More details can be found at:

https://www.transportation.gov/sites/dot.gov/files/docs/EAPP_2_FAQ_1.pdf

This information was issued by U.S. Department of Transportation, Office of Aviation Enforcement and Proceedings on August 19, 2011 and was revised September 6, 2011; October 19, 2011; January 11, 2012; June 15, 2012; and May 8, 2015.

Overview of Provisions Related to Tarmac Delay Contingency Plans:

- Requires foreign air carriers operating to or from the U.S. with at least one aircraft with 30 or more passengers to adopt and adhere to Tarmac Delay Contingency Plans.
- Requires U.S. and foreign air carriers to not permit an international flight to remain on the tarmac at a U.S. airport for more than 4 hours without allowing passengers to deplane subject to safety, security, and ATC exceptions.
- Expands the airports at which airlines must adhere to the contingency plan terms to include small hub and non-hub airports, including diversion airports.
- Requires U.S. and foreign carriers to coordinate plans with Customs and Border Protection (CBP) and the Transportation Security Administration (TSA).
- Requires notification regarding the status of delays every 30 minutes while aircraft is delayed, including reasons for delay, if known.
- Requires notification of opportunity to deplane from an aircraft that is at the gate or another disembarkation area with door open if the opportunity to deplane actually exists.
- Requires all carriers that must adopt Tarmac Delay Contingency Plans to file data with the Department regarding lengthy tarmac delays.

Questions and Answers Related to Tarmac Delay Contingency Plans:

1. **Which carriers must have contingency plans for lengthy tarmac delays?**

   The rule requires a U.S. carrier and foreign carrier operating passenger service (scheduled or charter) using any aircraft with a design capacity of 30 or more passenger seats to adopt a contingency plan for lengthy tarmac delays. The requirement to develop and implement contingency plans would apply to all aircraft of those carriers, including those with fewer than 30 seats.

2. **Which airports must be covered by the contingency plans adopted by U.S. carriers?**

   A covered U.S. and foreign carrier must have a contingency plan covering each large, medium, small, and non-hub airport at which it operates…

3. **How many large, medium, small, and non-hub airports are there?**

   According to the Department's Bureau of Transportation Statistics (BTS) data, in calendar year 2009 (latest available data), there were 29 large hub airports, 36 medium hub airports, 72 small hub, and 231 non-hub airports…

4. **What must be included in the contingency plans?**
   - Assurance of sufficient resources to carry out the plan.
   - Assurance of coordination with airport authorities (including terminal facility operators where applicable) at all large, medium, small, and non-hub airports, including diversion airports.
   - Assurance of coordination with Customs and Border Protection (CBP) and the Transportation Security Administration (TSA) at all large, medium, small, and non-hub airports, including diversion airports.

(Questions 5 through 11 do not directly relate to Airport Contingency plan requirements)

12. **Are there other requirements the carrier must comply with to deal with lengthy tarmac delays?**

    Yes. A carrier must assure that it has sufficient resources to carry out the plan and that it will coordinate with airport authorities, CBP, and TSA at all large, medium, small, and non-hub airports that the carrier serves, including diversion airports.

13. **The rule requires carriers to coordinate their plans with "diversion" airports. Which diversion airports are expected to be included in this process?**

    We expect carriers to work with large, medium, small, and non-hub airports to which they regularly divert aircraft when an irregular operation exists.

14. **How can a carrier demonstrate that it has adequately coordinated its tarmac delay contingency plan with airport authorities (including terminal operators where applicable), CBP and TSA?**

    We expect carriers to provide the appropriate government personnel/office or airport authority with a copy of its contingency plan and to ask those entities to advise it on the adequacy of the plans, as related to that agency's responsibilities. We suggest that a carrier retain evidence of its efforts to coordinate with the airport authority (including terminal facility operators where applicable), CBP, and TSA to facilitate any review of such information by the Department and help demonstrate compliance with the rule.

15. **Does a carrier have an obligation to coordinate its contingency plan with Fixed Base Operators (FBOs) or another carrier that may assist with deplaning passengers that experience a lengthy tarmac delay?**

    The rule does not require a carrier to coordinate its plans with such entities, but the Department recommends that carriers do so in the event that such an entity may be able to assist with an incident involving a lengthy tarmac delay (e.g., deplaning passengers, providing ground handling services). Evidence of such coordination will also assist the Department in determining if a carrier is meeting the requirement that it has "sufficient resources to implement the plan."

Appendix A.3 Expanded List of Stakeholders and Stakeholder Group Communication Matrix

Expanded List of Stakeholders

Below is an expanded list of 45 stakeholder groups organized into six major categories. These groups should be considered in airport IROPS planning efforts as a member of the IROPS Contingency Response Committee or in some other capacity.

Local Airport

1. Airport Executive Management
2. Airport Operations Management (includes IROPS Committee)
3. Airport Airside Management
4. Airport Landside Management
5. Airport Terminal Management
6. Airport Emergency Operations/Communications
7. Airport Passenger Services (if other than Terminal Management)
8. Airport Maintenance
9. Airport Police
10. Aircraft Rescue & Firefighting (ARFF)
11. Airport Pet Relief Area Contact
12. Airport Concessions
13. Airport Public Relations
14. Airport Technology
15. Local Military Operations (if joint-use facility)
16. Fixed Base Operator (FBO)
17. Ground Handlers (if other than Airlines or FBO)
18. Aircraft Refueling Company (if other than FBO)
19. Aircraft Deicing Company (If other than FBO or Airline)

Regional Airports

20. Airport Operations (at regional airports)

Airlines

21. Airline Station Managers (at local airport)
22. Airline Station Managers (at regional airports)
23. Airline Operations Centers SOC/AOC (for all airlines serving local airport)
24. Airline Chief Pilot's Office, if available
25. Cargo Airlines (at local airport)

Government Organizations

26. FAA Tower
27. FAA TRACON (Approach Control)
28. FAA ARTCC (Enroute Center)
29. FAA Command Center
30. TSA (local) including TSA Stakeholder Manager
31. TSA (regional)
32. CBP (local)
33. CBP (regional)
34. Centers For Disease Control (CDC)

Outside Mutual Aid Partners

35. Local Police
36. Local Fire Department(s)
37. Local Red Cross
38. Local Taxi/Limo Service
39. Local Ground Mass Transportation (Bus, Metro, etc.)
40. Local Hotel(s)/Motel(s)
41. Local "Big Box" Stores
42. Other Local Mutual Aid

Passengers

43. Passengers aboard Aircraft
44. Passengers in Terminal
45. Passengers Arriving/Departing Airport

Stakeholder Group Communications Matrix

Table 1 is a breakout of the 45 stakeholder groups identified in the list on the previous page. The table includes recommendations for IROPS Contingency Response Committee participation and needed communications before, during and after an IROPS event.

It should be noted that the following communications tool for airport operations, Transportation Security Administration, Customs and Border Protection, airlines serving the local airport, and airlines diverting to the local airport explicitly includes information required to meet U.S.DOT and FAA regulations.

Table 1 – Stakeholder Group Communications Matrix.

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
Airport Executive Management	NO	Establish IROPS Contingency Response Committee Charter and Authority	BEFORE	Authority to Coordinate IROPS Response Planning	(To) Airport Operations Management
				Executive Level Status Reporting	(From) IROPS Contingency Response Committee
			DURING	Executive Level Status Reporting	(From) IROPS Contingency Response Committee
				Reporting to Board and outside Groups	(via Airport Public Relations)
			AFTER	Executive Level Status Reporting	(From) IROPS Contingency Response Committee
				Reporting to Board and outside Groups	(via Airport Public Relations)
Airport Operations Management (includes IROPS Committee)	YES	Provides Chair of IROPS Contingency Response Committee	BEFORE	Airport Capacity & Capability	(To) IROPS Contingency Response Committee
				Airport Operations IROPS Planning	
			DURING	Flight Status	(From) outside Sources (Federal & Other)

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
				IROPS Situation	(To) All affected Stakeholder Groups via IROPS Planning Process – Step #5
				IROPS Event Response Status	(To) Airport Executive Management
			AFTER	IROPS Event Response Status	(To) Airport Executive Management
Airport Airside Management	YES	Participates in local IROPS response planning	BEFORE	Runway & Landing Aides Capacity	(To) IROPS Contingency Response Committee
				Gate Accommodation Capacity	
				Airport Airside IROPS Planning	
			DURING	Runway & Landing Aides Availability	(To) IROPS Contingency Response Committee
				Gate Availability	
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.

Stakeholder Group	Member of IROPS Contingency Response Committee	Comments		Needed Information *Before, During and After IROPS Events*	Information (To) or (From) Organization (or via communication method)
Airport Landside Management	YES	Participates in local IROPS response planning	BEFORE	Gate Accommodation Capacity	(To) IROPS Contingency Response Committee
				Airport Landside IROPS Planning	
			DURING	Gate Availability	(To) IROPS Contingency Response Committee
				TSA Security Screening Availability	
				CBP Sterile Area Availability	
				CBP Screening Availability	
				PAX Deplanement Availability	
				Facilities Sharing Availability	
				Gate Sharing Availability	
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Airport Terminal Management	YES	Participates in local IROPS response planning	BEFORE	Gate Accommodation Capacity	(To) IROPS Contingency Response Committee
				Airport Terminal IROPS Planning	
			DURING	Gate Availability	(To) IROPS Contingency Response Committee
				Concessions Availability	

Appendix A.3

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
				TSA Security Screening Availability	
				CBP Sterile Area Availability	
				CBP Screening Availability	
				Facilities Sharing Availability	
				Gate Sharing Availability	
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Airport Emergency Operations/ Communications	YES	Participates in local IROPS response planning	BEFORE	Airport Emergency Operations/Communications Capacity	(To) IROPS Contingency Response Committee
				Airport Emergency Operations/Communications IROPS Planning	
			DURING	Airport Emergency Operations/Communications Center Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Airport Passenger Services (if other than Terminal Management)	YES	Participates in local IROPS response planning	BEFORE	Airport Passenger Services Capacity	(To) IROPS Contingency Response Committee
				Support Capability for Special Needs PAX	
				Airport Passenger Service IROPS Planning	

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
			DURING	Airport Passenger Services Availability	(To) IROPS Contingency Response Committee
			DURING	Special Needs PAX Support Availability	
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Airport Maintenance	YES	Participates in local IROPS response planning	BEFORE	Airport Maintenance Capacity	(To) IROPS Contingency Response Committee
			BEFORE	Airport Maintenance IROPS Planning	
			DURING	Airport Maintenance Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Airport Police	YES	Participates in local IROPS response planning	BEFORE	Airport Police Capacity	(To) IROPS Contingency Response Committee
			BEFORE	Airport Police IROPS Planning	
			DURING	Airport Police Availability	(To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.

Stakeholder Group	Member of IROPS Contingency Response Committee	Comments		Needed Information *Before, During and After IROPS Events*	Information (To) or (From) Organization (or via communication method)
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Aircraft Rescue & Firefighting (ARFF)	YES	Participates in local IROPS response planning	BEFORE	Aircraft Rescue & Firefighting (ARFF) Capacity	(To) IROPS Contingency Response Committee
				Aircraft Rescue & Firefighting (ARFF) IROPS Planning	
			DURING	Aircraft Rescue & Firefighting (ARFF) Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Airport Pet Relief Area Contact	YES	Participates in local IROPS response planning	BEFORE	Airport Pet Relief Capacity	(To) IROPS Contingency Response Committee
				Airport Pet Relief IROPS Planning	
			DURNG	Airport Pet Relief Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
Airport Concessions	YES	Participates in local IROPS response planning	BEORE	Airport Concessions Capacity	(To) IROPS Contingency Response Committee
				Airport Concessions IROPS Planning	
			DURNG	Airport Concessions Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Airport Public Relations	YES	Participates in local IROPS response planning	BEFORE	Airport Public Relations Capacity	(To) IROPS Contingency Response Committee
				Airport Public Relations IROPS Planning	
			DURING	Airport Public Communications Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
Airport Technology	YES	Participates in local IROPS response planning	BEFORE	Airport Technology Capacity	(To) IROPS Contingency Response Committee
				Airport Technology IROPS Planning	
			DURING	Airport Technology Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Local Military Operations (if joint-use facility)	YES	Participates in local IROPS response planning	BEFORE	Local Military Facility & Equipment Sharing Agreements	(To) IROPS Contingency Response Committee
			DURING	Facilities & Equipment Sharing Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.

Stakeholder Group	Member of IROPS Contingency Response Committee	Comments		Needed Information *Before, During and After IROPS Events*	Information (To) or (From) Organization (or via communication method)
Fixed Base Operator (FBO)	YES	Participates in local IROPS response planning	BEFORE	Ground Handling (if other than Airlines), Fueling, & Deicing Capacity Agreements	(To) IROPS Contingency Response Committee
				FBO IROPS Planning	
			DURING	Fixed Base Operators (FBOs) Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Ground Handlers (if other than Airlines or FBO)	YES	Participates in local IROPS response planning	BEFORE	Ground Handling Capacity Agreements	(To) IROPS Contingency Response Committee
				Ground Handlers IROPS Planning	
			DURING	Ground Handlers Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Aircraft Refueling Company (if other than FBO)	YES	Participates in local IROPS response planning	BEFORE	Aircraft Refueling Capacity Agreements	(To) IROPS Contingency Response Committee
				Aircraft Refueling IROPS Planning	

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
			DURING	Aircraft Refueling Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Aircraft Deicing Company (If other than FBO or Airline)	YES	Participates in local IROPS response planning	BEFORE	Aircraft Deicing Capacity Agreements	(To) IROPS Contingency Response Committee
			BEFORE	Aircraft Deicing IROPS Planning	
			DURING	Aircraft Deicing Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Airport Operations (at regional airports)	NO	Establish communication & coordination procedures	BEFORE	Airport Capacity & Capability	(To) IROPS Contingency Response Committee (both Local & at Regional airport)
			BEFORE	Support Capability for Special Needs PAX	(To) IROPS Response Coordination Committee (at regional airport)

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
				Airport Operations (at regional airports) IROPS Planning	
			DURING	IROPS Situation	(To) All affected Stakeholder Groups via IROPS Planning Process – Step 5
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Airline Station Managers (at local airport)	YES	Participates in local IROPS response planning	BEFORE	Airline Equipment & Facilities on site	(To) IROPS Contingency Response Committee
				Facilities & Gate Sharing Agreements	
				Airline – Airline Support Agreements	
				Ground Handling Capability & Agreements	
				Fueling Agreements	
				Catering Agreements	
				Deicing Agreements	

Appendix A.3

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
Airline Station Managers (at local airport)				CBP Agreements	
				TSA Agreements	
			DURING	Facilities & Gate Sharing Availability	(To) IROPS Contingency Response Committee
				Catering Availability	
				Airline – Airline Support Availability	
				Ground Handling Availability	
				Fueling Availability	
				Deicing Availability	
				TSA Availability	
				CBP Availability	
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
	NO	Establish communication & coordination procedures	BEFORE	Airline Equipment & Facilities On-site Capability	(To) IROPS Contingency Response Committee (both Local & at Regional airport)
				Facilities & Gate Sharing Agreements Capability	

Stakeholder Group Communications Matrix

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
Airline Station Managers (at regional airports)				Airline – Airline Support Agreements Capability	
				Ground Handling Capability & Agreements Capability	
				Fueling Agreements Capability	
				Catering Agreements Capability	
				Deicing Agreements Capability	
				CBP Agreements Capability	
				TSA Agreements Capability	
			DURING	Facilities & Gate Sharing Availability	(To) IROPS Contingency Response Committee (both Local & at Regional airport)
				Catering Availability	
				Airline – Airline Support Availability	
				Ground Handling Availability	
				Fueling Availability	
				Deicing Availability	

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
				TSA Availability	
				CBP Availability	
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee (both Local & at Regional airport)
Airline Operations Centers SOC/AOC (for all airlines serving local airport)	NO	Establish communication & coordination procedures	BEFORE	Identification & Notification of Regular Diversion Airports	(To) IROPS Contingency Response Committee
				Flight Status (by exception) Communications Agreements	
			DURING	Flight Status (by exception) Communication Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Airline Chief Pilot's Office, if available	NO	Establish communication & coordination procedures	BEFORE	Flight Status (by exception) Communications Agreements	(To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
			DURING	Flight Status (by exception) Communication Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Cargo Airlines (at local airport)	NO	Establish communication & coordination procedures	BEFORE	Flight Status (by exception) Communications Agreements	(To) IROPS Contingency Response Committee
			DURING	Flight Status (by exception) Communication Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
FAA Tower	YES	Participates in local IROPS response planning	BEFORE	Flight Status (by exception) Communications Agreements	(To) IROPS Contingency Response Committee
			DURING	Flight Status (by exception) Communication Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
FAA TRACON (Approach Control)	YES	Participates in local IROPS response planning	BEFORE	Flight Status (by exception) Communications Agreements	(To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
			DURING	Flight Status (by exception) Communication Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
FAA ARTCC (Enroute Center)	NO	Establish communication & coordination procedures	BEFORE	Flight Status (by exception) Communications Agreements	(To) IROPS Contingency Response Committee
			DURING	Flight Status (by exception) Communication Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
FAA Command Center	NO	Establish communication & coordination procedures	BEFORE	Flight Status (by exception) Communications Agreements	(To) IROPS Contingency Response Committee
			DURING	Flight Status (by exception) Communication Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
TSA (local) including TSA Stakeholder Manager	YES	Participates in local IROPS response planning	BEFORE	TSA Security Screening Capacity Agreements	(To) IROPS Contingency Response Committee
			DURING	TSA Security Screening Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
TSA (regional)	NO	Establish communication & coordination procedures	BEFORE	TSA Security Screening Capacity Agreements	(To) IROPS Contingency Response Committee
			DURING	TSA Security Screening Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
CBP (local)	YES	Participates in local IROPS response planning	BEFORE	CBP Sterile Area Agreements	(To) IROPS Contingency Response Committee
				CBP Screening Capacity Agreements	

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
			DURING	CBP Screening Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
CBP (regional)	NO	Establish communication & coordination procedures	BEFORE	CBP Sterile Area Agreements	(To) IROPS Contingency Response Committee
			BEFORE	CBP Screening Capacity Agreements	
			DURING	CBP Screening Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee
Centers For Disease Control (CDC)	NO	Establish communication & coordination procedures	BEFORE	Disease Control Capacity Agreements	(To) IROPS Contingency Response Committee
			DURING	Disease Control Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
Local Police	NO	Establish communication & coordination procedures	BEFORE	Local Police Capacity Agreements	(To) IROPS Contingency Response Committee
			DURING	Local Police Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee
Local Fire Department(s)	NO	Establish communication & coordination procedures	BEFORE	Local Fire Department(s) Capacity Agreements	(To) IROPS Contingency Response Committee
			DURING	Local Fire Department Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee
Local Red Cross	NO	Establish communication & coordination procedures	BEFORE	Local Red Cross Capacity Agreements	(To) IROPS Contingency Response Committee
			DURING	Local Red Cross Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
Local Taxi/Limo Service	NO	Establish communication & coordination procedures	BEFORE	Local Taxi/Limo Service Capacity Agreements	(To) IROPS Contingency Response Committee
			DURING	Local Taxi/Limo Service Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee
Local Ground Mass Transportation (Bus, Metro, etc.)	NO	Establish communication & coordination procedures	BEFORE	Local Ground Mass Transportation Capacity Agreements	(To) IROPS Contingency Response Committee
			DURING	Local Ground Mass Transportation Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee
Local Hotel(s)/ Motel(s)	NO	Establish communication & coordination procedures	BEFORE	Local Hotel(s)/Motel(s) Capacity Agreements	(To) IROPS Contingency Response Committee
			DURING	Local Hotel(s)/Motel(s) Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
Local "Big Box" Stores	NO	Establish communication & coordination procedures	BEFORE	Local "Big Box" Stores Capacity Descriptions	(To) IROPS Contingency Response Committee
			DURING	Local "Big Box" Store Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee
Other Local Mutual Aid	NO	Establish communication & coordination procedures	BEFORE	Other Local Mutual Aid Capacity Agreements	(To) IROPS Contingency Response Committee
			DURING	Other Local Mutual Aid Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee
Passengers aboard Aircraft	NO	Establish communication & coordination procedures	BEFORE	None	
			DURING	Flight Status (from Airline Station Manager) Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
Passengers in Terminal	NO	Establish communication & coordination procedures	BEFORE	None	
			DURING	Flight Status (from Airline Station Manager) Availability	(To) IROPS Contingency Response Committee
				Concession Status Availability	
				Local "Big Box" Status Availability	
				Gate Status (from Airline Station Manager) Availability	
				Extended-Stay Accommodations Status Availability	
				Local Hotel/Motel Status	
				Local Transportation Status Availability	
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee

Table 1 – Stakeholder Group Communications Matrix.					
Stakeholder Group	**Member of IROPS Contingency Response Committee**	**Comments**		**Needed Information** ***Before, During and After IROPS Events***	**Information (To) or (From) Organization** **(or via communication method)**
Passengers Arriving/ Departing Airport	NO	Establish communication & coordination procedures	BEFORE	None	
			DURING	Flight Status (from Airline Station Manager) Availability	(To) IROPS Contingency Response Committee
			AFTER	Lessons Learned	(via survey) (To) IROPS Contingency Response Committee

An editable Microsoft Word version of this matrix can be found in the **Checklists for Stakeholder Communication & Coordination** on **CRP-CD 180.**

Appendix A.4 Checklist for Maintaining a Stakeholder Contact List

After the IROPS Champion has established a *Stakeholder Contact Team* using IROPS Contingency Response Committee members representing airport operations, concessions, airline station managers, and government agencies as these organizations have the primary contacts with other stakeholder groups, the Stakeholder Contact Team should do the following:

1. **Establish a 24/7 stakeholder contact list:**
   - ☐ Use **Appendix A.5** – **Expanded Template for Stakeholder Contact Details** as a template to compile an initial list of 24/7 contact information for all stakeholders.
   - ☐ Divide the list among team members to gather the information.

2. **Test the 24/7 stakeholder contact list:**
   - ☐ Once the initial list has been developed, assign team members to stakeholders from the list in order to test and verify that contact information is accurate. This is a critical step to ensure there are no inaccuracies.
   - ☐ Conduct testing on a regular basis. The team should develop a testing schedule that can be synchronized with quarterly or seasonal meetings.

3. **Publish the 24/7 stakeholder contact list:**
   - ☐ Make sure that all stakeholders in an airport's region are provided the published list.

4. **Update the 24/7 stakeholder contact list:**
   - ☐ The team should ask for any 24/7 contact updates at quarterly or seasonal IROPS meetings as well as at annual regional/diversion workshops.

5. **Develop communication protocols:**
   - ☐ The team should develop communication protocols for the IROPS Contingency Response Committee and associated stakeholder organizations that remind them to provide the Stakeholder Contact Team with updates when there are personnel changes.

An editable Microsoft Word version of this checklist can be found in the **Checklists for Stakeholder Communication & Coordination** on **CRP-CD 180.**

Appendix A.5 Expanded Template for Stakeholder Contact Details

Table 2 can be used to collect stakeholder contact details for an Airport's IROPS Contingency Response Committee and other points of contacts for agencies that are not part of the Committee. This 24/7 contact list is to be used during an IROPS event.

Table 2 – IROPS Contingency Response Committee.

Table 2 – IROPS Contingency Response Committee. Please modify this table as appropriate for your needs, and add additional rows as necessary.		
Organization	**Contact Name & Phone Number**	**Alternate Contact**
Committee Chairperson		
Airport Operations		
Airline Operations		
Airline Station Managers (NOC, OCC or SOC)		
Concessions		
Ground Transportation		
Hotels		
Government Agency - FAA		
Government Agency - TSA		

Table 2 – IROPS Contingency Response Committee. Please modify this table as appropriate for your needs, and add additional rows as necessary.		
Organization	**Contact Name & Phone Number**	**Alternate Contact**
Government Agency - CBP		
Government Agency - DOT		
Public Safety Operations		
Diversion Airport		
Fixed Base Operations		
Military (if joint-use)		
Emergency Response		
Executive Management Liaison		

An editable Microsoft Word version of this template can be found in the **Checklists for Stakeholder Communication & Coordination** on **CRP-CD 180.**

Appendix A.6 Data Resources

A. Federal Data Sources for Real-Time Data or Historic Data

There are a multitude of available data resources useful for irregular operations planning and impact mitigation. **Table 3** summarizes major federal data resources and identifies public availability and whether it is useful in real-time or historic use.

Real-time flight data is available from the Air Traffic Control System Command Center's Web Portal http://www.fly.faa.gov, which is further defined below.

Table 3 – ATCSCC Web Portal Data Resources for Real-time Use.

Resource	URL	Notes
Advisories Database	http://www.fly.faa.gov/adv/advADB.jsp	
Aviation Information System (AIS)	https://www.fly.faa.gov/ais/jsp/ais.jsp	The operating status of the nation's largest airports and delay information from the FAA can be sent to wireless device, pager, phone, or email in real-time, as changes happen
Current reroutes	http://www.fly.faa.gov/ratreader/jsp/index.jsp	
Current restrictions	http://www.fly.faa.gov/current_restrictions/jsp/index.jsp	
Operation Information System (OIS)	http://www.fly.faa.gov/ois/	
Flight Delay Information	http://www.fly.faa.gov/flyfaa/usmap.jsp	

In addition, diversion forum information can also be found at:

http://www.fly.faa.gov/Diversion/diversion.jsp.

Historic data from federal sources can be found in **Table 4**.

Table 4 – On-line Federal Data Resources for Historic Use.

Resource Name	URL	Publicly Available?
Aviation System Performance Metrics (ASPM)	http://aspm.faa.gov	Partially *
Operations Network (OPSNET)	https://aspm.faa.gov/opsnet/sys/main.asp	Yes
Traffic Flow Management System (TFMS)		No
Traffic Flow Management System Counts (TFMSC)	https://aspm.faa.gov/tfms/sys/main.asp	Yes
Airline Service Quality Performance (ASQP)	https://aspm.faa.gov/asqp/sys/main.asp	Yes
National Traffic Management Log (NTML)		No
Diversion Recovery Tool		No
Diverted Flight List		No
Aviation Data and Statistics	http://www.faa.gov/data_research/aviation_data_statistics/	Yes
Bureau of Transportation Statistics (BTS)	http://apps.bts.gov/	Yes
Aviation Consumer Reports	https://www.transportation.gov/airconsumer/air-travel-consumer-reports	Yes

** Upon request, airport authorities may obtain ASPM higher level data access.*

B. Weather Data

National Oceanic and Atmospheric Administration's (NOAA) Aviation Weather Center maintains the http://aviationweather.gov web portal providing weather observation and forecast data for a variety of weather phenomena, including convection, turbulence, icing, winds, ceiling, visibility, and others. NOAA's web portal data resources include those identified in **Table 5.**

Table 5 – NOAA's Web Portal Data Resources.

Resource	URL	Notes
Forecast and past weather information	http://www.weather.gov	National Weather Service
	http://www.noaa.gov	
Weather outlook; historical hurricane tracks and climate at a glance	http://climate.gov	
NWS GIS Data Portal	http://www.nws.noaa.gov/gis	Geographic Information System (GIS)
National Climatic Data Center provides Daily and monthly summary observations; climate indices; historical global ship tracks; NEXRAD radar data.	http://gis.ncdc.noaa.gov/	
Public access to the Nation's climate and historical weather data and information	http://www.ncdc.noaa.gov	NOAA's National Climatic Data Center (NCDC)

C. Code-Sharing Data

The U.S. Air Carrier Licensing Division maintains a code-share list for various types of air carriers at http://www.dot.gov/policy/aviation-policy/licensing/code-sharing. This is an informal compilation of code-share relationships and does not represent a complete compilation of all code shares, as new code-share relationships are continually being developed. It is also important to note that this list is not an official document of the U.S.DOT. This list may provide useful information to diversion airports that may occasionally receive diverted flights from carriers they normally do not service.

D. Other Flight Data Resources

The following are resources for information related to air travel in the United States. The resources are identified in **Table 6** in alphabetical order with brief explanations of available data provided, and URLs are indicated, unless restricted.

This is not a complete list, but the information is valid as of the writing of this guide. Additionally, some of the resources are company products that must be purchased, such as Aerobahn by SAAB Sensis. Others are available in a limited form for free, such as PASSUR, but require contractual arrangements to access all of their data. Whether or not these are available to the general public, they are available and currently in use to one degree or another by operators, airport management and Air Navigation Service Providers.

Table 6 – Other Flight Data Resources.

Resource	What	URL
Airline information	Flight information, schedule disruptions	Airline websites, ex: http://www.delta.com/
Airport Management	Irregular operations advisories	websites ex: http://www.metroairports.org/Airport-Authority.aspx
ARINC - Aeronautical Radio Incorporated *	Communications, Engineering, Systems Integration	http://www.arinc.com/capabilities/
EUROCONTROL NOP	System status, delays, etc.	https://www.public.cfmu.eurocontrol.int/PUBPORTAL/gateway/spec/index.html
Flight Aware	Flight tracking	http://flightaware.com/
Flight Radar 24	Flight tracking	http://www.flightradar24.com/
Flight Stats	Flight status, airport info, weather, mobile APPs, etc.	http://www.flightstats.com/go/Home/home.do
Flight View	Flight status, airport info, weather, mobile APPs, etc.	http://www.flightview.com/
Harmony for Air Navigation Service Providers (Metron) *	Integrated Air Traffic Flow Management (I-ATFM) solution	http://www.metronaviation.com/products/metron-harmony/metron-harmony-for-ansps.html
Harmony for Airlines (Metron) *	Integrated Air Traffic Flow Management (I -ATFM) solution	http://www.metronaviation.com/products/metron-harmony.html
Media, airline source	Airline status reports, disruption alerts, etc.	Airline websites
News media, electronic	Web, mobile, any public place where people gather	http://www.cnn.com/ http://www.msn.com/ local TV stations
News media, print	Newspapers (*USA Today, NY Times,* etc.)	google by name
PASSUR *	Tracking data	http://www.passur.com/
Report 65	Irregular operations	http://www.trb.org/Publications/Blurbs/166569.aspx
Sensis (Aerobahn) *	Tracking data	http://www.saabsensis.com/products/aerobahn/
Skift *	Reports on trends	http://skift.com/travel-trends/the-rise-of-the-silent-traveler-reaching-out-to-the-mobile-first-travel-consumer/

Resource	What	URL
Symphony (Exelis) *	Tracking data	http://www.exelisinc.com/solutions/Symphony/Pages/default.aspx
Egencia	Travel APP	http://www.egencia.com/en/
FlightCaster Pro	FlightCaster can predict your probability of delay, hours before the airline or any other APP notifies you.	http://download.cnet.com/FlightCaster-Pro/3000-20428_4-75344350.html
iFly Pro	Airport guide APP	http://www.ifly.com/iFlyProApp.html
WhatsBusy	Security Delay Information	http://www.whatsbusy.com/airport/

***** *Data requires fee for use.*

Appendix A.7 Annual IROPS Checklist

Airports can use an annual checklist to ensure they and their stakeholders are IROPS-ready each year. The checklist provided in this appendix is based upon case studies from this research project and addresses the top reasons airports fail to effectively mitigate IROPS situations, which include:

- Lack of communication with other stakeholders.
- IROPS Plan not fully aligned with all regional stakeholders.
- Notification procedures that fail, both internally between airport and other service provider stakeholders, and externally with passengers and the public, especially related to diversions.
- Regional capacity constraints of stakeholders unknown or misunderstood.
- Airport IROPS plans that are either too detailed or too unstructured for stakeholders to use in an actual event.
- No clear guidance on which stakeholder is responsible for covering IROPS-related expenditures, causing response delays.
- Stakeholder equipment and technology failures.
- Inability of all stakeholders to manage escalating circumstances.
- Lack of a stakeholder recovery plan.
- No accountability for stakeholders to improve IROPS plans.

An editable Microsoft Word version of this checklist can be found in the **Checklists for Stakeholder Communication & Coordination** on **CRP-CD 180.**

1. Establish and maintain trust with stakeholders:

- ☐ Meet regularly with the following stakeholders via meetings, workshops or training sessions that involve using the IROPS Risk Assessment Tool:
  - ☐ Airport Public Affairs: Establish/review staffing plan for on-site participation during IROPS events.
  - ☐ Airlines: understand diversion priorities, aircraft towing/gate needs (e.g., wide-body aircraft), staffing availability (use of third-party vendors/communication).
  - ☐ Local FAA: Communicate any aircraft parking changes at airport, establish/review capacity constraints policy.
  - ☐ Local TSA: Establish/review security procedures for stranded passengers.
  - ☐ Local CBP: Establish/review plans for diverted international flights/deplaning.
  - ☐ Concessions: Establish/review after-hours plans, staffing plans, and plans for limiting alcohol sales during extended-delay situations.

2. Establish a fully aligned IROPS Plan with regional stakeholders:

- ☐ Test the IROPS plan via the IROPS Risk Assessment Tool or follow-up tabletop exercises to assess how diversions are allocated in a region and to make personnel IROPS-ready.
- ☐ Establish a formal recall plan for all stakeholders.
- ☐ Include a Stranded Passenger Plan that may involve creating printed handouts, purchasing comfort kits, delineating quiet space, and accessing volunteers.
- ☐ Establish MOUs or other agreements with stakeholders outside of IROPS Contingency Response Committee.

3. Create common notification procedures, primarily for diversion and extended-delay events:

Internally:

- ☐ Update regularly 24/7 regional stakeholder list.
- ☐ Identify a primary contact who is someone easily accessible (include landline, cell/text, email, other communication methods) and several backup contacts with same information.
- ☐ Ensure a backup plan for communication is clearly defined and understood by stakeholders (e.g., use text messaging if there is no cell phone coverage).
- ☐ Test the notification system and plan for periodic "live" tests throughout the year.

Externally:

- ☐ Establish/refine passenger communication plans involving procedures for updating airport website, using social media, and flight information display systems (FIDS), among others.
- ☐ Discuss with all regional stakeholders how to coordinate proactive messaging with one another, especially during surge, capacity, after-hours, and extended-stay situations where passengers and the public need real-time, accurate and consistent information.

4. Understand and communicate the capacity constraints of all airports in a region:

- ☐ Establish/update/share a centralized list of equipment and resources available in a region.
- ☐ Develop plans that include alternate or multiple service providers/vendors.

5. Develop a "Quick-Action" guide for practical use during an IROPS event to improve stakeholder coordination:

- ☐ Evaluate/streamline IROPS processes with easy-to-use checklists for each causal condition and for each stakeholder role/responsibility.

6. **Determine which stakeholder is responsible for covering IROPS-related expenditures before an event occurs:**
   - ☐ Establish/clarify funding sources for different IROPS-related costs between airlines (especially with third-party airline operating companies) and airports.
   - ☐ Establish/update an Open Purchase Order for airport IROPS costs, such as food for airport employees.

7. **Develop maintenance and backup plans for equipment and technology used by various stakeholders:**
   - ☐ Develop/update an equipment plan for use by airport maintenance, third-party operators, FBOs, and/or ground handlers with considerations for extended use in extreme conditions.
   - ☐ Develop/update a backup plan for technology (e.g., cell phone)/power failures.
   - ☐ Consider upgrading technology for cell phones and/or Wi-Fi service.

8. **Develop common stakeholder triggers for escalating IROPS situations:**
   - ☐ Develop/update trigger procedures that determine when an IROPS Plan is activated.
   - ☐ Develop/update trigger procedures that determine when Incident Command procedures are activated.
   - ☐ Develop/update trigger procedures that determine when an Airport Emergency Plan is activated.

9. **Ensure all stakeholders have an IROPS Recovery Plan:**
   - ☐ Develop/update checklists for restoring stakeholder operations to normal operations, especially related to maintenance and custodial services (e.g., additional staffing needed to collect blankets or maintain bathrooms).

10. **Develop stakeholder accountability procedures to ensure improvements:**
    - ☐ Develop/update After-Action Report (or Action Item List) that assigns personnel to responsibilities. Ensuring actions are logged, maintained and updated ensures accountability.
    - ☐ Update IROPS Plan from After-Action Report or Action Item List.
    - ☐ Test IROPS plans updates via the IROPS Risk Assessment Tool.
    - ☐ Update training as needed.

Appendix A.8 Case Studies and U.S.DOT Aviation Enforcement Order Summaries

Case studies related to IROPS planning and responses were conducted at eight airports of varying sizes from across the nation. In addition, a summary list of U.S.DOT aviation enforcement orders related to IROPS events includes descriptions of those events and the research team's analysis of lessons that can be learned from these events.

For each of the eight airport case study interviews, a member of the research team spoke either face to face or via phone interview with an airport operations or management staff member. The U.S.DOT aviation enforcement order summary list was derived from research focused on collecting factual data from each enforcement order, and includes takeaways from our team's understanding of how these events could potentially have been mitigated.

Table 7 highlights case studies and U.S.DOT aviation enforcement order summaries from the research project along with the major takeaways related to each of them.

Table 7 – Case Studies and U.S.DOT Aviation Enforcement Order Summaries.

Case Study Participant	Size	Case Study Overview	Major Takeaways
1. Minneapolis-St. Paul International Airport (MSP)	Large hub airport	Event: Thunderstorm Factors: Multiple airline diversions, regional coordination, internal and external communication and coordination Planning: IROPS Plan in place; training	• Uses timely notification technology to alert regional airports (diversions) and concessionaires (extended operations) • IROPS champion manages events and triggers Incident Command (IC) when needed • Effectively collaborates with various stakeholders to manage passengers during extended delays • Attains integrated collaboration via annual IROPS workshops for the region
2. Atlanta Hartsfield-Jackson International Airport (ATL)	Large hub airport	Event: Region-wide ice and snow Factors: Extended-delay situation Planning: IROPS Plan in place; training	• Advanced situational awareness and notification via a surface management system • Airlines alleviate challenging weather situations by reducing schedule in advance of storms • Airport activates NIMS/IC structure for managing major storms • Distributes overnight kits to passengers during extended delays • Attains integrated collaboration via seasonal IROPS training for the region and pre-season briefings for tenants • Accountability process: Corrective action items from IROPS event debriefings are handled by task force • Public Affairs participates in EOC and uses social media to keep public informed • Airport Security, Operations and Compliance System (ASOCS) provides passive information to stakeholders
3. Duluth International Airport (DLH)	Non-hub primary airport	Event: After-hours international diversion during sub-zero temperatures Factors: International flight after hours; equipment malfunctions in sub-zero temperatures Planning: IROPS Plan in place	• Stakeholder collaboration enabled new terminal area to be used as a dedicated customs processing area • Social media is used by the airport to keep passengers informed • Need for inclusion of more stakeholders in IROPS planning (e.g., hotels and restaurants) • Need for better/faster diversion notification from the FAA and hub airports

Case Study Participant	Size	Case Study Overview	Major Takeaways
4. Milwaukee General Mitchell International Airport (MKE)	Medium hub airport	Event: Airport receives hundreds of diversions each year due to storms and occasional FAA system malfunctions Factors: Crew time expiration, overnight passengers, and third-party handler communication Planning: IROPS Plan in place	• Need for better collaboration with airlines (third-party staffing with no decision-making authority) and government agencies (understanding aircraft parking plan) to implement the IROPS Plan • Developed escalation plan with triggers for initiating an EOC • Developing centralized equipment list to help crews from diverted aircraft make better deplane/depart decisions • Uses several flight data sources to anticipate diversions • Developed passenger information handout for stranded passengers
5. Portland International Airport (PDX)	Large hub airport	Event: Regular power outages and winter storms Factors: Strong regional relationships/coordination Planning: Ad-hoc plans in place including a stranded Passenger Procedure and Snow & Ice Response Plan; Use of NIMS/IC system for large events, training	• Combination of ad-hoc plans and strong relationships with various stakeholders have generally assisted in mitigating IROPS events, but airport sees benefit of consolidated procedures and is moving in that direction. Example: Various and disparate plans have created confusion among stakeholders, particularly first responders • Need consolidated plan to be effective; good relationships with most stakeholders is not enough • Need formal notification, communication procedures and related training • Need to develop a resource database with all stakeholders • Need more "push" notification technology instead of passive technology • Need to determine who "pulls in" departments and agencies as necessary to resolve IROPS issues • The Media and Government Relations Department has created a template for their use in all events to ensure standardization between events and among information providers • Need formal debriefing plan and corrective action/tracking system • Developed a snow and ice "quick reference" manual • Stranded Passenger Program's "comfort kits" have been successful
6. Lester B. Pearson International Airport (YYZ)	N/A	Event: Regional ice storm affecting YYZ and all reliever airports; Factors: Diversions, Terminal Surge, Extended-delay, Stranded Passengers Planning: No IROPS Plan; 14 Ad-hoc plans; Uses IMS (like NIMS), training	• Need culture change; operating in silos, both intra and inter-organizationally with little impetus for collaboration • Implementing technology to improve situational awareness and encouraging diversion airports to use the same technology • Need to determine various triggers to escalate operations effectively • Need equipment checks during extended-delay situations • Includes hub airlines on IROPS Committee • Need plan for continuous improvement • Created 18 different notification groups from its conference call group; each receives customized notification (issue: time consuming to make these notifications) • Building a bigger EOC; getting Wi-Fi and cell phone upgrades

Case Study Participant	Size	Case Study Overview	Major Takeaways
			• Action log creates accountability • Creating an airport IROPS Plan and developing partnering relationship with region
7. Denver International Airport (DEN)	Large hub airport	Event: Back-to-back snowstorms Factors: Airport closure, delays, deplanement, holiday recovery Planning: IROPS Plan in Place; training	• Accountability: Implemented a document control and change system for IROPS Plan and new training for new circumstances • Purchased surface tracking technology that provides real-time situational awareness to retrieve airline information and to assist in debriefing (data collection) • Implemented mass early-notification tool and procedure for use in diversions from/to hub airport • Assessed and purchased new equipment to match airline schedules • Developed new triggers and recovery process for "Overnight Passenger Service Plan" • Working with international carriers to obtain clarification on wide-body aircraft • Creating After-Action Reports • Winter operations training and meetings with stakeholders • Developed triggers and communication plans for various types of IROPS events • Recommend researching airline partners to determine where their diversion cities are and incorporate this information into early-notification processes and regional coordination efforts.
8. London Heathrow Airport (LHR)	N/A	Event: Severe Winter Storm Factors: Snow event caused 4 days of severe disruption during the busiest travel season of the year; didn't heed snow warning; lack of winter operations ground service equipment and supplies for stranded passengers, mixed messages, Planning: Snow Plan	• Enhanced snow plan, including optimizing resources, obtaining new equipment, establishing agreements with ground handlers, testing snow plans and appointing a Winter Operations Manager • Developed a command and control structure including escalation triggers, capacity constraint policy, enhanced situations awareness via technology and an airport operating center, and conducted training, and exercises • Established passenger welfare and communication protocols, including purchasing provisions; providing catering and retail; establishing agreements with airlines, hotels, and ground transportation; and using ambassadors and mobile screen technology along with social media, website and FIDS to communicate with passengers
9. U.S.DOT Aviation Enforcement Actions Summary	N/A	Event: U.S.DOT Enforcements Factors: Compliance with U.S.DOT rules Planning: Varies based on airline	• Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • Carrier contingency plans for lengthy tarmac delays should be fully coordinated with all scheduled and diversion airports as well as with their associated CBP, FBO, and other organizations. • Carrier contingency plans for lengthy tarmac delays should be reviewed to ensure they are fully compliant with current regulations.

Case Study and U.S.DOT Aviation Enforcement Order Summary Findings

Case studies and U.S.DOT aviation enforcement order summaries revealed that two primary components must be in place for an airport to achieve effective communication and collaboration between stakeholders in order to manage a wide range of IROPS situations:

1. Trusted relationships, and
2. Fully aligned IROPS mitigation processes.

Trusted relationships are needed to ensure that stakeholders will engage with one another in IROPS response efforts. Trust is an important element in building relationships and trust means having confidence in other stakeholders that they will fulfill their roles in mitigating IROPS impacts. A significant relationship breakdown between stakeholders can erode trust and lead to communication and collaboration issues during IROPS response efforts.

Fully aligned IROPS mitigation processes provide a framework for establishing working relationships, especially collaborative ones, between various stakeholder organizations, under the direction of one IROPS leader in a region. Airports vary in the type of plans they use. Many have formal IROPS plans, while others use a combination of informal or ad-hoc plans to outline roles and responsibilities for each stakeholder. However, a plan that is not fully aligned with all stakeholders under one IROPS leader is not dependable and may not be effective in mitigating all IROPS situations, especially those that are experiences new to stakeholders.

Fully aligned IROPS mitigation processes can and do exist even without some trusted stakeholder relationships. However, performance gaps are often exposed in parts of the plan where stakeholders are not committed to the process or where new situations reveal where stakeholders have been inadvertently omitted from the planning process. The converse is true as well. When trusted relationships exist, but no formal or informal plans are in place, there is no mechanism for accountability or shared situational awareness and, as a result, responsibilities can be mistakenly overlooked, especially in highly stressful conditions, exposing gaps in performance. Both situations can result in a diminished collaborative reputation for all stakeholders.

Building Trusted Relationships:

- **Host Regular Meetings, Workshops or Training Sessions with Stakeholders**. These gatherings hosted by an airport IROPS leader (e.g., IROPS Champion or IROPS Contingency Response Committee Chairman) provide the opportunity to get to know key personnel in a region so that stakeholders can discuss concerns and issues as well as:
  - **Update 24/7 stakeholder contact lists on a seasonal basis**. Many airports host winter and summer preparation meetings where this information can be shared. Having current contact information is key to ensuring all stakeholders are notified when IROPS events occur. Designating a staff member to test and confirm these numbers is also important for accuracy. Also essential is collecting backup/alternate contacts for people who are normally available.
  - **Discover where stakeholder relationships are broken.** Checking in with stakeholders on a regularly scheduled basis as well as after each IROPS event can help stakeholders identify where gaps may exist, especially those related to surge, capacity, after-hours, and extended-delay situations. Case study participants identified the following stakeholder agencies and departments as needing closer attention by airports:
    - **Airlines** – Hub airports should use collaborative meetings to communicate with airlines to understand what reliever airports their airlines and particularly their partner airlines divert to in order to manage capacity issues in a region. This knowledge is especially critical for airlines that use wide-body aircraft, as those aircraft require specific towing and gate accommodations. Airports also should discuss and understand airline staffing plans, particularly when airlines use third-party vendors, to ensure airlines have adequate personnel available during delay and diversion events and determine contacts that have decision-making authority. Delineating communication protocols with airlines during diversion situations is also suggested.
    - **FAA** – Airports need to communicate with the FAA so that FAA fully understands an airport's aircraft parking plan, ensuring diverted flights can access ground servicing equipment for refueling and the appropriate gate for deplaning passengers. When these details are overlooked, they can exacerbate delay situations. Establishing a capacity constraints policy with the appropriate FAA office can also help ensure both hub and reliever airports do not receive more aircraft than they can handle. In most cases the primary contact will be with the airports FAA Air Traffic Control Tower staff.
    - **TSA** – Airports should meet directly with their local TSA office to develop security procedures during IROPS events that allow stranded passengers who have left the sterile area to re-use boarding passes to be re-screened and allowed to re-enter the sterile area. This procedure enables passengers to move freely back and forth between the sterile and non-sterile areas (e.g., for food, smoking, etc.) while waiting on future travel arrangements.
    - **CBP** – Airports should meet directly with local CBP staff to make plans for diverted international flights that need to be deplaned. These plans should include provisions for handling items such as alcohol and tobacco that may be

legal to bring back to the destination country but is prohibited by the CBP to enter the U.S.

- **Concessions** – Airports should coordinate after-hours plans with concessions, considering appropriate concession levels needed, based upon passenger numbers, in various concourses and terminals. Other considerations should include determining limits on alcohol sales, and staffing plans for concessionaires whose employees work multiple jobs in service industry and may not be available to work extended hours.
- **Airport Public Affairs** – Airports should include a member from the Public Affairs Department on the IROPS Contingency Response Committee and the airport EOC when activated, to ensure someone from that department is on site during IROPS events to access the most up-to-date and accurate information for relaying to passengers.

– **Understand stakeholder capacity constraints.** Every service provider has a limit on staffing capabilities and resources that can be used during a diversion or delay event. Sharing a centralized list of equipment and resources available in a region with one another at regional workshops can help prevent overload and develop solutions that involve alternate or multiple service providers. Tabletop training can provide a means to test how diversions can be best handled without overloading any one stakeholder.

– **Improve shared situational awareness – with internal and external stakeholders**.

- **Internally (notification technology):** Working together, service provider stakeholders can discuss, evaluate, identify and select notification technology that works best for each service provider. In addition, a hub airport can hold a pre-event teleconference to discuss how stakeholders will communicate during a particular event and discuss weather forecasts, airline scheduling decisions, and concessions plans, among other things. Stakeholders can also discuss what sources will be used to monitor critical information such as flight status and weather forecasts. Recommendations include dividing into smaller "communication groups" for IROPS teleconferences to manage information flow more easily, and considering mass surface movement tracking and notification software in order to monitor flight deviations caused by weather.
- **Externally (source and message):** Airports should consider creating a strategy for communicating to affected passengers and the public at large to ensure the public knows where to get information (e.g., social media, website sources, FIDS, etc.) and ensure that a single message is communicated to avoid confusion.

Establishing Fully Aligned IROPS Mitigation Processes:

- **Establish a written and fully aligned IROPS Plan for all Stakeholders**: Generally, the individual airport culture seems to dictate whether case study participants used "handshake agreements", a compilation of ad-hoc plans, or fully consolidated and aligned written IROPS plans. However, case study participants with loosely formed plans or verbal agreements shared that, while they believe their plans do work in most IROPS situations, their plans did not hold up well during extenuating circumstances (e.g., new situations not encountered before or long-term events)

and that they were in the process of formulating fully aligned formal written plans with regional stakeholders under the direction of an IROPS Champion or designee.

- **Best Practice IROPS Plan Elements**: Some suggestions from case study participants include:
  - **IROPS Quick Guide for Stakeholders** – Developing a short, high-level overview of processes including communication checklists and other "at a glance" management procedures helps ensure that nothing is missed when time is of the essence. These quick guides can be tailored to particular IROPS event types so individuals can quickly notify and mobilize the right stakeholders and trigger correct procedures.
  - **Open Purchase Order** – Creating a pre-approved Open Purchase Order for things like extra food for front line employees or for stranded passengers ensures that these resources can be quickly procured. By delineating financial responsibilities before an event, stakeholder confusion over cost obligations can be alleviated.
  - **Staff Recall Plan** – A formal recall plan ensures that various stakeholder staff members understand their responsibilities and can be accessed either on weekends or after hours.
  - **Stranded Passenger Plan** – A plan focused on meeting customer needs during long-term events helps ensure that staffing and resources are allocated, and that stakeholders understand how to manage passengers during these times. Educating passengers via pre-printed handout materials regarding resources and options available to them (and providing them with an understanding of their rights) or handing out "overnight kits" assist with managing anxious travelers. Other considerations include establishing quiet spaces for sleeping passengers, and using volunteers/ambassadors to assist passengers. Another consideration is determining potential Wi-Fi and cell phone use during extended delays to determine whether technology expansion efforts are warranted.
  - **Recovery Plan** – Many case study participants mentioned that the recovery phase of an IROPS event is often overlooked at airports, and at a time when resources are thin and staff members are exhausted, airports and other stakeholders would benefit from checklists and protocols to assist in restoring airports to regular operations in an efficient manner (e.g., custodial contract modification to collect blankets distributed to passengers, etc.).
  - **Equipment Maintenance Plan** – Considerations are needed for organizations such as airport maintenance, third-party operators, FBOs, and/or ground handlers to formulate plans to keep equipment in good running order during extended-delay situations, especially cold weather situations that may cause equipment to freeze or long-term delays that may cause excess wear and tear on equipment.
  - **Escalation Procedures** – Developing common trigger procedures for stakeholders that identify when a situation warrants activation of an IROPS Plan and when an event escalates, triggering NIMS protocols or AEPs, is critical in

mitigating IROPS events effectively. Some airports and associated stakeholders are already using the NIMS structure as a management practice for all IROPS events.

- **After-Action Accountability** – Many airports discussed how formal debriefing sessions occur with stakeholders after most IROPS events, yet there are no accountability measures in place to ensure that updates to IROPS plans are made or training to reflect lessons learned takes place. Ensuring stakeholders are assigned to make changes through an After-Action Report or Action Item List that is logged and maintained ensures accountability.

The following detailed case studies provide insights from case study participants that demonstrate how relationships can be enhanced and processes can be improved in order to benefit the IROPS response planning efforts of airports of various sizes

A.8.1 Case Study 1: Minneapolis-St. Paul International Airport (MSP), Minneapolis, MN

Airport Overview: MSP is a large hub with total annual enplanements of approximately 17.0 million.

Current Airport IROPS Planning Efforts: MSP has established an irregular operations (IROPS) Committee, collaborative IROPS Plan with its region, and hosts annual regional workshops and seasonal training sessions.

IROPS Event Scenario:

- The airport experienced a June 2014 thunderstorm event with sustained straight-line winds at 60 knots from 180 degrees for 90 minutes. Loss of airline schedule integrity resulted in delays and 1,150 passengers missing their flights requiring overnight accommodations, and 59 hub airline diversions (none neared the 3-hour U.S.DOT domestic-flight limit).
- Airport operational impacts: Terminal facilities, regional coordination and concessions scheduling.
- Airline impacts: Delays, deplanement, schedule recovery, passenger handling, and gate scheduling.
- Airport facilities impacts: Surge, after-hours, and extended-delay situations.

Best Practices Related to Stakeholder Collaboration:

- IROPS Committee and Airport Operations: MSP IROPS' Champion collaborated with Airport Operations staff and set up an Incident Command (IC) in the Operations office during IROPS events to coordinate efforts.
- Airport Operations and Regional Stakeholders: Using the list of current, up-to-date, 24/7 regional contacts, established and maintained during an annual Regional IROPS workshop hosted at the airport, Airport Operations sent out a group email notifying those airports of the potential for upcoming diversions and suggested they "warm up" their IROPS plans. The airport also used an open conference "call bridge" both before and during the event to keep the region informed of status changes. Times for these calls were broadcast to all regional stakeholders via a pre-loaded group email list. A post-event "hotwash" also helped ensure continuity of operation and continuous improvement.
- Hub Airline and Airport Stakeholders Involved in Stranded Passengers: Once the hub airline notified Airport Operations to expect 1,000 overnight guests, Airport Operations activated their Terminal 1 phone list and informed all airport community to ensure all "stranded passenger" stakeholders were informed to implement their stranded passenger plans. These included all concessionaires, traveler's assistance volunteers, custodial staff, landside operations, and TSA.
- Airport Operations and Airport Maintenance: Airport Operations used an Open Purchase Order for providing food for its maintenance crews during extended operations, alleviating any cost concerns.
- Airport Operations and TSA: Airport Operations worked with the TSA to allow stranded passengers experiencing extended time at the airport to use their previous day's boarding pass to re-enter the sterile area during their stay at the terminal.
- Airport Operations and Diversion Airports. Airport Operations used mass surface tracking and notification tools to communicate timely knowledge of upcoming airline IROPS situations to understand airline scheduling and operational issues to stay in front of developing IROPS conditions. Written information shared between all regional airports during annual regional workshops communicating capacity constraints assisted in determining when each airport's ability to accommodate diverted aircraft reached its maximum during the winter event.
- Airport Operations and Passengers/Public: Airport Operations used Flight Information Display System (FIDS) screens and PIDS (Passenger Information Display System) screens to alert and inform

the traveling public of flight status and available terminal amenities. This augmented social media information and more conventional/traditional information dissemination media.

- Airport Operations and Weather Forecasting Organizations: Airport Operations continually monitored weather forecasts from various organizations that predicted high winds, enabling the airport to proactively manage delays and diversions.

Lessons Learned Related to Stakeholder Coordination:

- Airport Operations and the Public/Passengers: Improving public education so that passengers understand what rights they have and what responsibilities the airlines have will minimize uncomfortable confrontations between staff and the flying public. In addition, the airport found that it needs to create a better sleeping area that can be secured by someone like a Law Enforcement Officer (LEO) and controlled for lighting and noise.
- Airport Operations and Airport Public Affairs (PA): IROPS plan should include a provision for recalling PA staff to the airport for events of this nature and that PA staff should house themselves alongside operations staff to stay in immediate connection with on-going situational changes.
- Airport Operation and Maintenance/Custodial: During the recovery phase, it is important to designate responsibilities to maintenance or custodial contracts in order to collect and clean up blankets and leftover passenger kits after an event.
- Airport and Diversion Airports: It is important for the airport to continually assess potential diversion airports for inclusion in IROPS planning efforts. Some diversion airports that had not been party to past MSP regional workshops were used by the hub airline as diversion airports, but were not notified. Those airports were subsequently added to the mix for future workshops and for notifications.
- Airport, Airline and Concessions: It is important for airports to communicate how many airline passengers will be deplaned after normal operating hours so that the appropriate number of food and beverage businesses remain open to the public. The sale of alcohol during this event was reviewed. More drinking establishments than dining establishments were open late into the evening, causing problems associated with alcohol sales.

A.8.2 Case Study 2: Atlanta Hartsfield-Jackson International Airport (ATL), Atlanta, Georgia

Airport Overview: ATL is a large hub airport with 43 million annual enplanements.

Current Airport IROPS Planning Efforts: ATL has a comprehensive IROPS Extended-Delay Contingency Plan and a Hardstand Standard Operating Procedure (SOP) and has held two workshops to train and educate its regional stakeholders on this plan. It hosts tabletop reviews with its Winter Weather Task Force prior to each deicing season. ATL also holds an annual pre-season briefing for all tenants and an annual pre-season full-scale exercise to test equipment functionality, staff readiness, and to validate procedures. ATL has no relationships with diversion airports since diversions from ATL to the region are rare due to the hub airline proactively reducing their flight schedule well in advance of any storm event. ATL's Department of Aviation (DOA) has an Airport Concessions Team and an "Emergency Manager" position on staff.

IROPS Event Scenario:

- From February 9 through February 14, 2014, a winter storm hit the Atlanta metro area, and the surrounding region, dumping more than 4 inches of snow and, more problematically, ¼ to ½ inch of ice in the form of freezing rain, causing road closures due to icy surfaces.
- Airport operational impacts: Terminal facilities, regional coordination and concessions scheduling.
- Airline impacts: Delays, schedule recovery, passenger handling, and gate scheduling.
- Airport facilities impacts: After-hours and extended-delay situations.

Best Practices Related to Stakeholder Collaboration:

- Airport Operations and Department of Aviation Staff: For this storm, ATL's Emergency Operations Center (EOC) was activated for the first time for IROPS purposes, bringing in top management to the situation on a 24-hour basis. The National Incident Management System (NIMS) process is used for storm events, and the "Snow Boss" serves as the Incident Commander during winter storms, operating from a "Snow Desk" or from the EOC, depending on the severity of the IROPS event.
- Airport DOA and Airlines: For the four years prior to this storm, ATL and the airlines worked together to enhance surface movement software by incorporating Automatic Dependent Surveillance-Broadcast (ADS-B) transponders into its maintenance, operations and public safety (Aircraft Rescue & Fire Fighting [ARFF] and airline tug) vehicles. The addition of ADS-B transponders allows FAA air traffic controllers to view the vehicles on their Airport Surface Detection Equipment, Model X (ASDE-X) displays. The surface movement software system displays all vehicles equipped with global positioning system (GPS) transponders and ADS-B transponders, to include all vehicles that operate on the movement areas. As a result, all parties are seeing events unfold at the same time and can move forward collaboratively. DOA posts Notice to Airmen (NOTAM) messages on the system and has created a "dashboard" to allow stakeholders to access pertinent information as necessary.
- Hub Airline and Airport DOA: The hub airline preemptively reduced its schedule and the practices and procedures of the airport staff, the airport maintained close to normal operations during this storm.
- Airport DOA, Airlines and Air Traffic Control Tower (ATCT): DOA held a post-event debriefing after this event with the airlines, ATCT, and airport staff (including top management). Corrective action items from the debriefing went to a "Winter Weather Task Force" whose role it is to focus, specifically, on the problems identified. This group meets several times throughout the year.
- Airport DOA and City of Atlanta: All airport departments reported status updates to the airport community approximately every 90 minutes. A copy of this report was also sent "downtown" to city

offices. The report consists of email updates from each department that are cut and pasted into one report.

- Airport Concessions Team and Tenant Concessionaires: Airport's Concessions team that works with tenant concessionaires to have one vendor serving hot food open on each concourse around the clock. For IROPS events other than winter ops types, the Concessions Department will coordinate with vendors on off-hours operations.
- Airport DOA and Tenants: The DOA holds an annual winter weather tenant briefing. At that time, all contact numbers are re-verified.
- Airport Operations and Airport Public Affairs (PA) Department: PA staff members have a seat in the EOC so, throughout the event, they could stay abreast of changing conditions and standardize the information that went out to the airport community and the public. In addition, when the EOC is not formed, PA is represented at the "Snow Desk" along with Airside and Landside Operations and Maintenance departments.
- Airport Public Affairs (PA) Department and the Public: PA staff used social media to stay ahead of the public and control the message while getting out accurate data on a timely basis.
- DOA and other Stakeholders: Prior to a storm event, a decision is made whether or not to hold a pre-event conference call, depending upon the forecasted severity. If held, a notification to stakeholders will be sent via email providing call-in information on an 888 number. On that call, the stakeholders will discuss the forecast expectations, airline scheduling decisions, aircraft deicing plans, customer service plans, need for concessionaires to remain open longer or for 24-hour periods, and operations surrounding snow removal and ice control. In addition, ATL Operations staff make daily log entries of all significant events in the Airport Security, Operations and Compliance System (ASOCS). This information is also accessible to all who have a user name and password on their Web Emergency Operations Center ("WebEOC") software system. This provides a passive form of information sharing to all who have a need to know.

Lessons Learned Related to Stakeholder Collaboration:

- Hub Airport DOA and Regional Stakeholders: Regular training exercises that include tabletops to test winter plans that are in place should be added to the airport's schedule.

A.8.3 Case Study 3: Duluth International Airport (DLH), Duluth, Minnesota

Airport Overview: DLH is a non-hub primary airport with 154,000 annual enplanements.

Current Airport IROPS Planning Efforts: DLH has an IROPS Plan in place.

IROPS Event Scenario:

- DLH experienced an international flight diversion that needed to land in order to get a sick passenger off the aircraft. The diverted flight landed after hours. The weather at the time of the diversion was -50 degrees F with high winds that resulted in the failure of ground handler equipment. The baggage doors on the diverted aircraft were frozen shut and attempts to unfreeze them failed due to the cold and the wind. Wind chill issues also affected airline and airport personnel, which slowed response timing as personnel had to limit outdoor exposure time due to the threat of frostbite and other cold-related injuries. This medical diversion to deplane a sick passenger escalated into a day-and-a-half event.
- Airport operational impacts: Terminal facilities, regional coordination and concessions scheduling.
- Airline impacts: Delays, deplanement, passenger handling, and gate scheduling.
- Airport facilities impacts: After-hours and extended-delay situations.
- Additional impacts: Passenger lodging, booking, ticketing, and bag tags from a non-signatory, international airline.

Best Practices Related to Stakeholder Collaboration:

- Airport Operations and CBP: Airport Operations worked with the CBP personnel to utilize parts of the new terminal, including the dedicated customs processing area and adjacent area, for not only clearing passengers but also for providing an eating area for passengers.
- Airport Operations and Local Stakeholders: All stakeholders were able to respond in a timely manner even as the scenario changed due to communication plans and informal agreements in place that detailed responsibilities.
- Airport Public Affairs (PA) and the Public: Communication technology, including social media sites, were used by the airport during this diversion to keep everyone accurately informed as to what was going on at the airport.
- Airport Operations and Stakeholders: Airport Operations developed an After-Action Report (AAR) to assess what went well and what needed to be worked on with all stakeholders.

Lessons Learned Related to Stakeholder Collaboration:

- Diversion Airline and CBP: Decision making between the diversion airline flight crew and the CBP regarding deplaning and clearing customs was fairly lengthy during the unexpected extended-delay situation with no letters of agreements between those parties. This situation was exacerbated by boarding bridge and aircraft mechanical issues, which necessitated several planning changes. It showed the need for formal policies and procedures to include letters of agreement.
- Diversion Airport, Hub Airport and FAA: Airport staff are looking into additional communications tools for more efficient diversion notification from the FAA and from hub airports that divert aircraft to them. They currently use a system to receive information from Chicago O'Hare International Airport (ORD) and Minneapolis-St. Paul International Airport (MSP) that provides details on possible diversions and monitors regional and local weather systems and forecasts to be prepared. Staff are also looking into developing notification processes during medical emergencies.

- Diversion Airport and New Stakeholders: Diversion highlighted the need to involve stakeholder groups, including hotel and motel groups, transportation companies, and local restaurants in future IROPS planning.
- Diversion Airport and CBP: Diversion highlighted the need to determine how to handle items, such as alcohol and tobacco, that may be legal to bring back to the destination country but may not be allowed by the CBP.

A.8.4 Case Study 4: Milwaukee General Mitchell International Airport (MKE), Milwaukee, Wisconsin

Airport Overview: MKE is a medium hub airport with 3.2 million annual enplanements.

Current Airport IROPS Planning Efforts: MKE has developed an IROPS Plan with checklists, situational awareness technology (including multiple flight data sources), and a strategy for establishing and maintaining contacts. MKE Airport Operations also conducts a post-IROPS event review after each event to see what can be improved.

IROPS Event Scenario:

- MKE is impacted by winter storms bringing snow and ice as well as summer thunderstorms that not only affect its regularly scheduled airline traffic but account for the numerous diversions the airport receives on a yearly basis. MKE has primarily been impacted on several occasions over the past few years by diversions mainly from Chicago O'Hare International Airport (ORD) and Chicago Midway International Airport (MDW) due to weather, and occasional FAA system malfunctions (e.g., electrical outages and/or smoke in ORD's Terminal Radar Approach Control [TRACON] facility). MKE experiences hundreds of diversions on a yearly basis but most are in for refueling while waiting for their destination airport to clear so they can depart.
- Airport operational impacts: Terminal facilities, regional coordination and concessions scheduling.
- Airline impacts: Delays, deplanement, passenger handling, and gate scheduling.
- Airport facilities impacts: After-hours and extended-delay situations.
- Additional impacts: Crew time expiration and airline and third-party communications problems.

Best Practices Related to Stakeholder Collaboration:

- Airport Public Affairs (PA) and Passengers: PA uses a number of social media tools to keep the local population, media and passengers correctly informed on airport status and special situations, as well as regular terminal announcements for staff and passengers. A passenger information handout was developed to let stranded passengers know what amenities are in the area along with phone numbers and transportation options. This handout has worked well with IROPS events and has been well received by affected passengers.
- Airport Operations and Stakeholders: MKE Airport Operations uses various technologies for early diversion notifications.
- Airport Operations and Airlines: MKE Airport Operations has developed a centralized list of ground service equipment availability, primarily to help flight crews from diverted aircraft or dispatchers make decisions whether to deplane or depart.

Lessons Learned Related to Stakeholder Collaboration:

- Airport and Third-party Airline Operator: A need exists for the airport to collaborate with airlines that are handled by a third party. Third-party operators have no authority to make decisions for the airline, meaning the airport cannot make timely decisions with these operators during IROPS events.
- Airport and FAA: A need exists for the airport to share predetermined aircraft parking plan with FAA so they do not park aircraft in airfield area without access to ground servicing equipment, which can cause delays with refueling, difficulty in moving aircraft to a gate, deplaning passengers and/or delaying aircraft movements for departure.
- Airport and Airlines: A need exists for the airport to discuss with airlines the need for earlier and more proactive notification for assistance or the ability for the airline to provide more airline staffing

during IROPS events. Airlines have not typically communicated or coordinated in a timely manner with MKE. Airlines usually tend to express their needs at the latest possible moment or opportunity, expecting airport staff to be available to help them on short notice.

- Airport and Stakeholders: A trigger needs to be established for activating the Emergency Operations Center (EOC) when the number of projected diversions reaches a specified number of aircraft on the ground and delays persist to ensure effective notification and communication. The airport also needs to confirm that all required stakeholders are represented in the EOC (e.g., airline, FBO/fueler, CBP, etc.) to help make decisions. After-Action meetings are needed to ensure continuous improvement after significant IROPS events with all key stakeholders.

A.8.5 Case Study 5: Portland International Airport (PDX), Portland, Oregon

Airport Overview: PDX is a Large Hub Airport handling over 16 million passengers a year.

Current Airport IROPS Planning Efforts: PDX has developed a plan to meet the requirements of U.S.DOT rules governing passengers' rights; however, the airport does not currently have a detailed IROPS plan outlining standard operating procedures. It has established a stranded passenger procedure that is used in IROPS events as well as several other plans that serve specific situations (e.g., power outage, stranded passengers, snow and ice operations, communicable disease response, etc.). As there is no formal overarching IROPS plan, any IROPS events for which there is no established procedure are handled by the airport's Operations staff with support from the Emergency Management group who "pull in" departments and agencies as necessary to manage the events. Many ad-hoc plans rely on solid relationships with service providers and agencies (e.g., TSA, CBP, FAA, FBI) for assistance with mitigating IROPS events. A Snow and Ice Quick Reference manual has been developed to capture key items from the master plan and to help convey the management structure and objectives during winter events. PDX also conducts at least one tabletop exercise specific to each of its various plans annually. In addition, the airport has trained first responders in all departments for various types of IROPS and security events (e.g., weather, bomb threats, power outages, etc.). They also use the Incident Command (IC) system that follows National Incident Management System (NIMS) processes, resulting in a seamless command and control structure for large-scale events.

IROPS Event Scenario:

- PDX has had no significant, media attention-grabbing IROPS-type event; however, it has a history of power outages which has driven the airport to create response plans to deal specifically with that type of IROPS event. It also has experienced modest, yet impactful, winter storm events that have resulted in the development of a formal Snow and Ice Response Plan.
- Airport operational impacts: Terminal facilities, regional coordination and concessions scheduling.
- Airline impacts: Delays, deplanement, passenger handling, and gate scheduling.
- Airport facilities impacts: After-hours and extended-delay situations.

Best Practices Related to Stakeholder Collaboration:

- Airport Operations and Regional Stakeholders: To communicate situational awareness with the broader airport community stakeholders, the airport uses a passive system for notifications and updates of the operational status of the airport and its various systems. Although this is a passive system, Airport Operations has been successful in pushing the broader group of tenants to access this system for situational status information. It has proven invaluable during IROPS events and often results in a more efficient operation with fewer calls/inquiries to the Communications Center and other operational groups, allowing them to focus on the event. When an event becomes long-term and the EOC is activated, then the EOC takes over communication responsibilities, involving the Media and Government Relations Department's "Web-team" to update the airport's website. In addition, PDX's Snow & Ice Response Plan is updated and briefed on an annual basis with internal and external stakeholders.
- Media and Government Relations Department and EOC members: A PIO contact person is assigned to cover the airport 24/7. During IROPS events, a PIO representative remains in close contact with the Operations Department to stay immediately abreast of IROPS activities and, if an EOC is formed, will be represented in that center, as well.

- Media and Government Relations Department and the Public: The Media and Government Relations Department has created a template for their use in all winter events to ensure standardization between events and among information providers and to ensure the continuity of the information being provided to the public.
- Concessions Department and Terminal Concessionaires: The airport's Concessions Department has its own notification system in the event of circumstances requiring after-hours operations. The department is able to notify the terminal concessionaires when the need exists to stay open to meet the needs of passengers who have been forced to remain overnight in the terminal. This arrangement is in the form of a "gentlemen's agreement" and is activated through a group email notification.
- IT and Airport Operations: IT staff takes on-line training in basic 100 and 200 level ICS courses so that those with the knowledge of the tech resources will also understand how those resources are intended to be employed during IROPS events.
- Airport and Emergency Organizations: Within the Airports Emergency Management System (EMS) procedures, the Communications Center (airport dispatch/911) will push out pages and information to "Paging groups" (e.g., Port Managers' Group, Port plus Airline Managers' Group, etc.) to engage those offices in the event of emergency/IROPS situations. The database for these groups (e.g., cell, text, and email numbers and addresses) is updated on an annual basis.
- Airport and the Public: the airport's Stranded Passenger Program provides passengers with the necessities for an unanticipated night at the airport. It provides cots and blankets for up to 200 travelers remaining overnight and "comfort kits" (e.g., toothbrush, toothpaste, and other toiletries) to all in need. These kits have been donated by local community organizations.

Lessons Learned Related to Stakeholder Collaboration:

- Airport and Regional Stakeholders:
  - Fully aligned plan: PDX has established robust relationships with regional airports who keep PDX informed of current airline IROPS events, and PDX reciprocates in kind. These informal relationships and communication practices minimize the potential for surprises during airline diversion situations. However, any significant relationship breakdown could become a challenge for the airport. The airport would like to form an aligned plan that incorporates all "ad-hoc" plans to establish and delineate roles and responsibilities between all agencies (especially first responders). The plan, ideally, will include a formal communications plan, contact lists and appropriate "talk channel" information and notification protocols.
  - IROPS Training: The airport also needs to develop communication-related training focused on smaller, non-EOC activated IROPS events that would involve stakeholders such as concessions, hotels, etc.
  - Resource Capacity: The airport desires to formalize a process for regular inventory inspections and/or maintaining a broad, IROPS-related resource database for all stakeholders.
  - After-Action Accountability: The airport conducts formal "after-action" debriefs and discusses lessons learned with those stakeholders who played a role in the event, and has currently begun to formalize standard operating procedures related to implementing suggested corrective actions and tracking results so identified problems will not reoccur.
- Media and Government Relations Department and the Public: In coordination with the Operations and Customer Relations staff, the airport's Public Information Office needs to be more proactive with social media in the future to serve the public's need for information.

A.8.6 Case Study 6: Lester B. Pearson International Airport (YYZ), Toronto, Canada

Airport Overview: YYZ has 19.3 million annual enplanements.

Current Airport IROPS Planning Efforts: YYZ is still in the process of developing an IROPS-type of plan with its stakeholders. It also relies heavily on various technologies to provide situational awareness during IROPS events. There is currently a two-pronged approach to refining the IROPS development process: (1) An initiative aimed at harmonizing 14 various IROPS-type plans currently in use, and (2) a YYZ initiative aimed at bringing in all regional stakeholders to harmonize responses and remove redundancies.

IROPS Event Scenario:

- On January 4, 2014, a severe weather (regional ice storm) event began at YYZ that lasted 5 days, affecting much of Eastern Canada and the Northeastern Seaboard of the U.S. The storm and its aftermath would eventually cause significant disruptions to all of the airports in those regions and especially at YYZ. Flash ice closed many airports in the two regions causing numerous diversions to the few airfields that were still able to handle arrivals. YYZ Pearson, with one runway open throughout the storm, received in excess of 40 mainline diversions. The airport's NAVCANatm (NAV Canada Air Traffic Management) system operation was unable to provide real-time situational awareness for all stakeholders during this event.
- Airport operational impacts: Terminal facilities, regional coordination and concessions scheduling.
- Airline impacts: Delays, diversions, deplanement, passenger handling, baggage handling, and gate scheduling.
- Airport facilities impacts: Surge, after-hours, and extended-delay situations.

Best Practices Related to Stakeholder Collaboration:

- Airport and Regional Stakeholders:
  - YYZ uses a software program that connects with NAVCANatm for real-time information on flight status for all airborne airliners. With this tool, YYZ has immediate ability to watch where aircraft are heading and can alert regional diversion airports, through a regional airport call group. YYZ is recommending to all of its regional partner airports that they also become licensed to use this program so they can see what is happening in the air and be prepared.
  - For diversion events, YYZ conducts a series of conference calls with key players of all stakeholder groups, notified by their communications software in advance, triggered by the weather forecast 24 hours in advance. The first call is held with the airport's "core planning group" which consists of representatives from two airlines (80% of YYZ's operations), NAV Canada, the Central De-ice Facility (CDF), various offices within YYZ and the airport's contract weather service provider. The purpose is to determine potential operational levels based upon the forecast. A secondary call, again with pre-notification via communication software, is conducted with the rest of the community, which primarily includes the remainder of the airlines and concessionaires. The purpose of this call is to debrief the rest of the airport community on what was decided in the earlier call regarding intended levels of operation during the weather event.
- Airport and Airlines: One of its two largest carriers has a representative in the Integrated Operations Control Center (IOCC) 18 hours a day as a normal operation, affording immediate contact between the airport and this carrier. Other airlines are considering this as well.

Lessons Learned Related to Stakeholder Collaboration:

- Airport and Regional Stakeholders:
  - The storm revealed that the Emergency Operations Center (EOC) could not accommodate all stakeholders. The airport has since remodeled the center so that all needed stakeholders can communicate effectively in one room.
  - Training related to identifying impending IROPS situations and associated potential significance is also recommended. Training on following established radio protocols (both staff members and within the community) is also needed.
  - Not only were trigger events missed early on, regional weather worsened and diversions quickly escalated out of the control of the overnight staff. Therefore, the airport is creating Key Performance Indicators (KPI) to act as "triggers" for IROPS events. The optic for this process will be a color-coded system allowing staff to recognize when a situation is moving from green (normal ops) into yellow (cautionary), so as to require initiation of contingency plans, preventing the situation from moving into red (elevated).
  - After this storm, the airport appointed one person, a Duty Manager (a position that rotates normally on a shift basis), as the "IROPS Champion" to see the big picture and "connect the dots" so problem areas do not get lost and are unaddressed between stakeholders. For 95% of events that occur at YYZ, the Duty Manager will control the event response and maintain this IROPS 'Champion' position. If, however, the EOC is formed, The IOCC Director or other airport Directors on "Standby" will assume that role from his Chair in the EOC. Escalation can also move from the Director to VP level should circumstances warrant.
  - YYZ always holds debriefings of all response events, regardless of their severity, but it is working on developing an "action log" to ensure that someone follows up on a corrective action.
  - YYZ's conference call technology allows for 120 participants per call, which had been problematic. YYZ has established 18 different groups, such as the "Core Planning Group" and Senior Management (for sensitive information) that notifications can be sent to requesting participation on conference calls.
- Airport and Airlines: While the airport has chosen one system to keep all parties up to date as events unfold, the airlines prefer "push" type messages to be sent to them with specific information so they don't have to search the airport's system for updates. The airport also uses another system to push messages; however, these messages take time to write. The airport is adjusting assignments within the IOCC to better manage this communication process.

A.8.7 Case Study 7: Denver International Airport (DEN), Denver, Colorado

Airport Overview: DEN is a large hub airport with 26.0 million annual enplanements.

Current Airport IROPS Planning Efforts: DEN has an IROPS Plan, has appointed an IROPS Committee and IROPS Champion, and also has trained stakeholders on this plan. The plan includes an Overnight Passenger Service Plan (OPSP).

IROPS Event Scenario:

- In 2012, DEN experienced back-to-back snowstorms that deposited that an initial 24 inches of snow. A week later, an additional 9 inches fell. On top of the record snowfall, the airport and surrounding areas experienced ground blizzard conditions reducing visibilities to levels below operational minimums, closing the airport. During the closure, crews were pulled from the airfield to assure their personal safety. When it became possible for crews to resume their work, it took approximately 22 hours for the snow drifts to be cleared sufficiently to resume aircraft operations.
- Airport operational impacts: Terminal facilities, runway availability, roadways, regional coordination and concessions scheduling.
- Airline impacts: Delays, diversions, deplanement, passenger handling, baggage handling, holiday hours, staffing requirements, and gate scheduling.
- Airport facilities impacts: Surge, capacity, after-hours, and extended-delay situations.

Best Practices Related to Stakeholder Collaboration:

- Airport and Regional Stakeholders: The airport has clearly defined, agreed-upon triggers with key stakeholders (e.g., airport operations, maintenance, customer service, airline station and ramp operations, and government agencies: FAA, CBP and TSA) related to various IROPS event types. After-Action Reports (AARs) document the event and provide the baseline of continuous improvement for all stakeholders. Following a major event and the completion of an AAR Document, the Operations team updates standard operating procedures (SOPs) and contingency plans where needed.
- Airport Operations and Maintenance: Operations partners with Field Maintenance to hold a joint training event in early August to prepare for Winter Operations/Snow Plan and does a dry run of snow routes.
- Airport Operations, FAA Tower, Terminal Radar Approach Control Facilities (TRACON) and FAA Center: A special meeting is held with the FAA Tower, TRACON and FAA Center to review the Winter Operations/Snow Plan routes and lessons learned from prior year.

Lessons Learned Related to Stakeholder Collaboration:

- Airport and Airlines:
  - The airport purchased surface tracking technology that provides real-time situational awareness to assist with improving airline communication.
  - The airport is working with international carriers and Airbus to obtain clarification on which carriers have tow bars in order to better serve them, especially during diversion events.
  - The airport has recommended researching airline partners to determine where their diversion cities are (especially with the three major mergers and regional partners) and incorporate this information into early-notification processes and regional coordination efforts.
- Airport and Diversion Airports: The airport implemented a mass early-notification tool and procedure to communicate diversions to the region.

- Airport and Regional Stakeholders:
  - The airport works with each stakeholder to review the IROPS plans and SOPs and return to Document Review for continuous improvement. This keeps rigorous operational planning process and procedures up to date and with alignment with all stakeholders.
  - The airport identified the need to test and confirm 24/7 contact information as the industry has on-going staffing changes.

A.8.8 Case Study 8: London Heathrow Airport (LHR), London, England

Airport Overview: LHR has 36.7 million annual enplanements.

Current Airport IROPS Planning Efforts: LHR recently developed a comprehensive Airport Operational Resilience Plan that outlines airport crisis communication protocols with key stakeholders, particularly between operations and corporate affairs. LHR now uses an Airport Communications and Command Center for Stakeholders. Various forms of communication have also been designed to ensure that all parties (internal airport staff, community stakeholders, media and passengers) are kept informed during the disruption and deployed. This includes a combination of situational reports, conference calls, social media, email update and press releases.

IROPS Event Scenario:

- From December 17-23, 2010, the airport experienced a significant storm and recorded its highest ever amount of snow in 1 hour a week before Christmas. That 1 hour of snowfall caused 4 days of severe disruption during the busiest travel week of the year. Up to 10,000 passengers a night camped out in terminals and more than 4,000 flights were canceled. Stranded passengers slept in rail stations while deliveries of blankets were blocked by the snowbound highways. Airport runways were shut down for 36 hours.
- Airport operational impacts: Terminal facilities, runway availability, roadways, regional coordination and concessions scheduling.
- Airline impacts: Delays, diversions, deplanement, passenger handling, baggage handling, holiday hours, staffing requirements, and gate scheduling.
- Airport facilities impacts: Surge, capacity, after-hours, and extended-delay situations.

Best Practices Related to Stakeholder Collaboration:

- Airport and the Public and Regional Stakeholders: Airport used various technology to communicate with the public including Twitter, Facebook, the Airport Website and FIDS.

Lessons Learned Related to Stakeholder Collaboration:

- Airport and Ground Handlers: Airport enhanced snow plan by establishing new agreements with ground handlers to work together jointly to clear ramp and gate areas. The airport also tested airside and landside snow plans.
- Airport and Regional Stakeholders: The airport appointed a full-time Winter Operations Manager (IROPS Champion), procured multiple weather forecast providers, developed and communicated clear escalation triggers for snow and other events, and trained staff on new crisis management response by conducting desktop exercises, and drills and simulations focused on crisis response protocols. The airport also developed an agreement on control center strategy and location. It enhanced situational awareness via vehicle tracking (transponders fitted to vehicles involved in snow clearance, displaying status and location) and extra closed-circuit television (CCTV) views. (More CCTV across the airport extend visual coverage for incident response teams.) Additionally, the airport developed a staffing and resource allocation plan for all crisis response levels and opened an airport operating center.
- Airport and Local Air Traffic Control (ATC): The airport developed a capacity constraints policy that was agreed upon with Local ATC to balance capacity.
- Airport and Passengers: The airport evaluated a Flight Information Display System (FIDS) prototype: new mobile flight display units to provide clear information for passengers, developed a new

standard for airline and passenger welfare support via Passenger Welfare Protocols. It is considering improvements to passenger facilities (e.g., sufficient space, a quiet and clean environment). It is now providing catering and retail via pre-agreed plans for providing vouchers to passengers during disruption so that they can buy food or drink, and it has new agreements in place with airport retailers to extend opening hours and maintain key supplies such as baby food, diapers and basic medical supplies. It is also assisting with hotel accommodations, providing ground transportation coordination to hotels, and flight rebooking assistance and baggage repatriation. The airport can lift restrictions on the internet, telecoms and media Wi-Fi to enable passengers who need to use the internet during disruption periods. In addition, Internet desks can be enabled for free use. The airport has organized a 24/7, 365 days-a-year passenger-welfare duty team. It improved passenger communication through a Reservist Program, where office-based, non-operational staff employees have been trained to support during times of major disruption. Reservists are aligned to support specific terminals, are easily identified by their purple 'Here to Help' uniform and provide passengers with information via laptop, iPad and BlackBerry devices.

A.8.9 Summary of U.S.DOT Aviation Enforcement Orders

Table 8 – Summary of U.S.DOT Aviation Enforcement Orders to Date.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
1	**November 2009**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Flight operated by regional affiliate carrier was diverted because weather precluded landing at the destination airport. The regional carrier did not follow the procedures of the booking airline or of the regional carrier pertaining to lengthy ground delays. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** (a) This event occurred prior to 3-Hour and 4-Hour rules. (b) Procedures related to lengthy ground delays existed but were not followed, (c) another carrier's station manager at the diversion airport erroneously indicated that the passengers could not be deplaned as it was after the diversion airport had closed for the night. All three carriers were fined. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. (b) Carrier contingency plans for lengthy tarmac delays should be fully coordinated with all scheduled and diversion airports as well as with their associated TSA organizations. • **Special Tools/Items to Share:** None identified.
2	**November 2009**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Flight operated by regional affiliate carrier was diverted because weather precluded landing at the destination airport. A station manager of an airline that served the diversion airport was asked for assistance for the diverted flight. The station manager incorrectly repeatedly asserted that the terminal was closed to passengers and thus was a significant cause of the passengers not being allowed to deplane after the lengthy ground delay. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** (a) This event occurred prior to 3-Hour and 4-Hour rules. (b) Because neither the carrier operating the diverted flight, nor the booking airline served the diversion airport, the carrier operating the flight contacted the station manager of a third airline which did serve the diversion airport requesting assistance. (c) The contacted station manager erroneously indicated that the passengers could not be deplaned as it was after the diversion airport had closed for the night. All three carriers were fined. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
3	**November 2011**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Failure by the carrier to adhere to the assurances in its contingency plan for lengthy tarmac delays that the carrier would not permit a domestic flight to remain on the tarmac for more than 3 hours without providing passengers an opportunity to deplane. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Procedures existed relating to carriers providing passengers an opportunity to deplane before tarmac delays exceed 3 hours, but they were not followed. Carrier chose not to deplane passengers on holding aircraft remotely on the airfield via airport buses because the carrier did not want to expose passengers to high noise and a poorly lit environment. However, the carrier admits that by the time it considered the possibility of utilizing airport busses to offload passengers, the coordination time for the busing operations would have put the waiting flights beyond the 3-hour limit. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
4	**August 2012**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Failure to inform passengers on a flight delayed at the gate for a lengthy period of the opportunity to deplane. Moreover, carrier failed to include certain required assurances in its contingency plan for lengthy tarmac delays. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** (a) Procedures related to providing passengers an opportunity to deplane before delays at the gate exceed 3 hours existed but were not followed (b) carrier tarmac delay contingency plans must address all required topics and provide all required assurances. (A tarmac delay begins when passengers no longer have the option to get off an aircraft, which usually occurs when the doors of the aircraft are closed. Complications may occur if the doors remain open at a gate or another disembarkation area but passengers are unaware that the door to the aircraft is open and that they have the option to deplane, particularly during a departure delay at the gate or on an aircraft where passengers do not know that the door was open and deplaning was an option.) • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. (b) Carrier contingency plans for lengthy tarmac delays should be reviewed to ensure they are fully compliant with current regulations. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
5	**September 2012**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Failure to adhere to the assurances in its contingency plan for lengthy tarmac delays that the carrier would not permit an international flight to remain on the tarmac for more than 4 hours without providing passengers an opportunity to deplane. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Because complications of severe weather and interruptions in Landing System at scheduled airport, flight remained in holding pattern for 40 minutes before attempting to divert to principal diversion airport. However, this airport was unable to accommodate the flight, as it was already handling a large volume of international diversions. At this point, the captain decided to divert to a different diversion airport due to limited amount of fuel. After landing the flight and being instructed to park at a remote aircraft bay/deicing pad, refueling was delayed due to increased demand for fuel by other diverted traffic and flight's remote parking location, which necessitated the use of fuel trucks that had to cross active taxiways in order to reach the aircraft to deliver the fuel. Although the captain and first officer were able to safely deplane the aircraft via air stairs in order to conduct external safety inspections of the aircraft, the Carrier believed that deplaning passengers via air stairs may have been unsuitable due to the inclement weather, as well as the number of passengers requiring wheelchairs and the number of small children on board. However, the Carrier made no other attempts to deplane passengers by any other means (e.g., via a gate or mobile airport lounge) or to solicit assistance from the Airport Operator. Also, the Carrier never contacted CBP to inquire about deplaning passengers. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. (b) Carrier contingency plans for lengthy tarmac delays should be fully coordinated with all scheduled and diversion airports as well as with their associated CBP organizations. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
6	**December 2012**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Carrier failed to adhere to the assurances in its contingency plan for lengthy tarmac delays that the carrier (1) would not allow an aircraft to remain on the tarmac for more than 4 hours before allowing passengers an opportunity to deplane, and (2) would provide customers with food and water within 2 hours after the aircraft left the gate in the case of a tarmac delay. Moreover, carrier failed to include certain required assurances in its contingency plan for lengthy tarmac delays. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Carrier pushed back from gate 45 minutes after scheduled departure. Inclement weather and traffic on the tarmac and runways delayed departure, and after 1 hour and 15 minutes, the aircraft was relocated to a remote position on the tarmac to begin refueling, which continued an additional 1 hour and 15 minutes. Passengers were kept aboard the aircraft during this time and were neither given the opportunity to deplane nor provided with food service. After refueling was completed, the aircraft moved to the taxiway to await clearance for take-off. After another 3 hours and 30 minutes, and not being able to confirm a possible departure time with Air Traffic Control, the captain decided to postpone the flight, and passengers were given the opportunity to deplane 6 hours and 45 minutes after the aircraft left the gate. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. (b) Carrier contingency plans for lengthy tarmac delays should be reviewed to ensure they are fully compliant with current regulations. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
7	**December 2012**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Failure to inform passengers on a flight delayed at the gate for a lengthy period of time of the opportunity to deplane. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Boarding was delayed by 50 minutes because of a late inbound aircraft arrival. After the boarding process was completed, inclement weather resulted in an additional delay while the aircraft was parked at the gate. During this gate delay, passengers remained on board the aircraft with the door to the aircraft open and the jet bridge attached. The delay at the gate lasted 2 hours and 16 minutes, until the door to the aircraft was closed and the aircraft left the gate. Passengers were not notified that they had the opportunity to deplane the aircraft during this delay. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • **Special Tools/Items to Share:** None identified.
8	**February 2013**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Failure to inform passengers on a flight delayed at the gate of the opportunity to deplane. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** After Carrier pushed back from gate; however, because of a maintenance issue, the aircraft returned to a gate and the doors were opened. Once at the gate and the opportunity to deplane existed, the Carrier failed to make an announcement notifying passengers of that opportunity to deplane. The aircraft doors were closed again, but because of another mechanical issue the flight was ultimately canceled and passengers deplaned. Passengers were not notified that they had the opportunity to deplane the aircraft during this delay. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. (Carrier noted that refresher communication training has been effective). • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
9	**March 2013**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Carrier failed to adhere to the assurances in its contingency plan for lengthy tarmac delays that the carrier (1) would not allow an aircraft to remain on the tarmac for more than 4 hours before providing passengers an opportunity to deplane, and (2) would provide customers with food and potable water no later than 2 hours after the aircraft left the gate in the case of a tarmac delay. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Carrier pushed back a few minutes after scheduled but was unable to depart because Air Traffic Control temporarily suspended departures due to poor weather conditions. After a lengthy wait time, the aircraft needed to be refueled. One hour and 53 minutes after leaving the gate, the aircraft parked on a hardstand at a remote gate to be refueled, where the aircraft remained for 36 minutes. Passengers were not offered the opportunity to deplane while the aircraft was being refueled because the terminal was unable to provide the carrier with a staircase at its remote location due to the inclement weather and the number of aircraft on the ramp. The aircraft pushed back from the remote gate at 5:36 p.m. EDT, but the aircraft was unable to depart as the weather continued to hinder landings and take-offs. After another lengthy wait, the aircraft was returned to another remote gate to refuel. However, due to the heavy ramp activity, the aircraft was delayed on the tarmac. The aircraft blocked in at the remote gate 4 hours and 3 minutes into the tarmac delay. Passengers were not immediately given the opportunity to deplane because the crew needed to wait for a proper staircase to be delivered. A staircase was eventually delivered, and passengers who wished to deplane could disembark from the aircraft 4 hours and 28 minutes after the aircraft had initially left the gate. Passengers were offered meals while at the second gate awaiting clearance for take-off, but this was after 4 hours from initial departure. The result was the Carrier had failed to provide passengers an opportunity to deplane before the tarmac delay exceeded 4 hours, and had made no attempt to provide food or water to passengers within 2 hours after the flight left the gate. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
10	**May 2013**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Carrier failed to inform passengers on a flight delayed at the gate for a lengthy period of time of the opportunity to deplane. In addition, carrier failed to include certain assurances in its contingency plan for lengthy tarmac delays. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Carrier pushed back from the gate as scheduled but because of severe thunderstorms, the departure was delayed. After waiting on the tarmac for approximately an hour and a half, the aircraft needed to be refueled and returned to the gate. While at the gate, the aircraft doors remained open. The aircraft pushed back from the gate a second time and experienced another delay of 2 hours and 25 minutes before it took off. Carrier did not announce that passengers had the opportunity to deplane when the aircraft sat at the gate with its doors open while the aircraft was being refueled. In addition, the Carrier's contingency plan for lengthy tarmac delays posted on its website was found to have required assurances either misstated, incomplete, or completely absent. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. (b) Carrier contingency plans for lengthy tarmac delays should be reviewed to ensure they are fully compliant with current regulations. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
11	**July 2013**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Carrier failed to adhere to the assurance in its contingency plan for lengthy tarmac delays that the carrier would not allow an aircraft to remain on the tarmac for more than 3 hours for domestic flights before providing passengers an opportunity to deplane • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Complicating the challenging severe winter weather situation on the ground was that several of the Carrier's deicing trucks unexpectedly failed, resulting in very reduced deicing capacity. Arriving flights combined with the departing flights that had to return to the gate because of extended deicing times resulted in all of the Carrier's gates being occupied. The Carrier contacted the airport to seek additional space to park and for assistance with bussing. However, two flights were not assigned gates until almost 3 hours after landing, and no attempt had been made to move aircraft already located at the Carrier's gates until just eight minutes before the 3-hour limit. Because the wheels of the aircraft parked at the gate, the gate was not made available for another 40 minutes. A second aircraft was not dispatched to a hardstand until 2 hours and 30 minutes after landing, and did not park at that hardstand for another hour • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. (b) Carrier contingency plans for lengthy tarmac delays should be fully coordinated with all scheduled and diversion airports as well as with their associated FBO organizations • **Special Tools/Items to Share:** None identified

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
12	**August 2013**	• **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** The flight was diverted because weather and limited fuel remaining on board precluded landing at the destination airport. Aircraft was directed to a gate where it was refueled and where it stayed for approximately 1 hour. After leaving the terminal, the carrier spent 4 more hours at the airport before departure some 5 hours and 20 minutes after arrival. Carrier failed to adhere to the assurance in its contingency plan for lengthy tarmac delays that the carrier would not permit an international flight to remain on the tarmac for more than 4 hours without providing passengers an opportunity to deplane. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** After landing at its diversion airport, Carrier felt allowing passengers to deplane was not necessary due to having no knowledge of additional delays at the time and due to the time it would take to establish the sterile area required when deplaning an international flight. Carrier never contacted CBP to inquire about deplaning passengers. After leaving the terminal, aircraft spent approximately 4 more hours including time in a waiting area and on a taxiway. Carrier made no attempts during this time to deplane passengers or to solicit assistance from the Airport Operator in deplaning. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. (b) Carrier contingency plans for lengthy tarmac delays should be reviewed to ensure they are fully compliant with current regulations. (c) Carrier contingency plans for lengthy tarmac delays should be fully coordinated with all scheduled and diversion airports as well as with their associated CBP organizations. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events **Lessons Learned related to IROPS Communication & Coordination**		
ID#	**Date/ Location**	**Description**
13	**October 2013**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Carrier permitted thirteen domestic flights to remain on the tarmac for more than 3 hours without providing passengers an opportunity to deplane and, in the case of two flights, failed to provide operable lavatories during lengthy tarmac delays. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Several of the flights at issue were operated by other carriers doing business code-share agreements with the booking Carrier. Additionally, if the booking Carrier reaches gate saturation, it has in place a plan for tandem parking operations at gates and attempting to use other airlines' gates. Due to the ramp closures and reduced yet steady arrival of aircraft during a severe weather event, congestion on the airfield and at the gates increased. As the event progressed, the Carrier chose not to initiate diversions to other airports as the incoming traffic resulted in twice the number of aircraft on the ground compared to normal peak period. Further, the Carrier did not contact the airport's personnel for assistance during any of the ramp closures. Additionally, although pilots of the affected flights attempted to contact the Carrier's local operations personnel, there were periods of time they were not responsive to requests for gate assignments. Although the Carrier had a contingency plan for lengthy tarmac delays, the plan was inadequate to a gate saturation event. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. (b) Carrier contingency plans for lengthy tarmac delays should be reviewed to ensure they are fully compliant with current regulations. (c) Carrier contingency plans for lengthy tarmac delays should be fully coordinated with all scheduled and diversion airports. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
14	**November 2013**	• **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Carrier failed to adhere to the assurance in its contingency plan for lengthy tarmac delays that the carrier would provide adequate food and water no later than 2 hours after an aircraft leaves the gate if the aircraft remains on the tarmac. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** The delay occurred during and after a severe thunderstorm. Once the tarmac delay had lasted approximately 90 minutes, flight attendants served snacks and beverages to passengers seated in the first-class cabin. However, by the time the tarmac delay had lasted 2 hours, flight attendants had failed to serve snacks and water to all passengers seated in the coach cabin. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • **Special Tools/Items to Share:** None identified.
15	**January 2014**	• **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Carrier failed to inform passengers on a flight delayed for a period at the gate with the door open that they had the opportunity to deplane. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** After pushing back from gate, captain received a mechanical alert and returned to a gate to be serviced. Carrier sat at the gate for over an hour but did not announce to passengers that they could deplane; then, after pushing back and receiving a second mechanical alert, the aircraft again returned to the gate to be serviced. This time the aircraft was at the gate longer than 2 hours, and again the passengers were not told they could deplane. The aircraft departed the gate for a third time, only to have another mechanical alert. This time the captain decided to cancel the flight. Ultimately, passengers disembarked the aircraft more than 5 hours after originally scheduled to depart. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
16	**April 2014**	• **Factors for Selection:** U.S.DOT Enforcement Action. • **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** This consent order concerns violations regarding two separate flights. In one instance, the carrier failed to adhere to the assurance in its contingency plan for lengthy tarmac delays that the carrier would not permit an international flight to remain on the tarmac for more than 4 hours without providing passengers an opportunity to deplane. In a second instance, the Carrier failed to inform passengers on a flight delayed at the gate with the door open for a lengthy period of time of the opportunity to deplane. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Departure was delayed in the first instance due to adverse weather conditions that necessitated deicing. Carrier stated that pursuant to standard operating procedures during deicing operations, the aircraft was detached from the jetway and the doors remained closed for safety reasons, and that reattaching the aircraft to the jetway would likely have disrupted the deicing attempts and resulted in cancellation of the flight. U.S.DOT regulations require carriers to provide passengers on international flights the opportunity to deplane before the flight has been on the tarmac for more than 4 hours. The carrier's decision not to provide passengers with an opportunity to deplane as an operational decision does not fit within the exception to the tarmac delay rule. In the second instance, the Carrier pushed off the gate and then returned because of a mechanical issue and the doors were opened. The aircraft remained at the gate with its doors open until passengers deplaned 4 hours later; however, the Carrier did not announce that passengers had the opportunity to deplane while the aircraft was at the gate with its doors open. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
17	**May 2014**	• **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Carrier failed to adhere to the assurance in its contingency plan for lengthy tarmac delays that it would not permit an international flight to remain on the tarmac for more than 4 hours without providing passengers an opportunity to deplane. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Carrier initially believed it was not required to file a Tarmac Delay Report because the "gate departure time" for the flight did not reflect a lengthy tarmac delay. Gate departure time is defined as "the instant when the pilot releases the aircraft parking brake after passengers have boarded and aircraft doors have closed." The Carrier released the aircraft parking brake and left the gate 1 hour and 3 minutes later. At that time, passengers had boarded and the aircraft doors had closed, but the aircraft did not take off. In this situation, although it may have appeared based on the gate departure and take-off times that the tarmac delay was 1 hour and 3 minutes, the tarmac delay was 5 hours, since the aircraft was on the ground for that period with no opportunity for passengers to deplane. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • **Special Tools/Items to Share:** None identified.
18	**October 2014**	• **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Carrier failed to adhere to the assurance in its contingency plan for lengthy tarmac delays that it would not permit an international flight to remain on the tarmac for more than 4 hours without providing passengers an opportunity to deplane. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Carrier stated that numerous flights had been delayed at their diversion airport and that the carrier did not seek a gate or another disembarkation point in a timely manner because they expected to quickly refuel and depart. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • **Special Tools/Items to Share:** None identified.

U.S.DOT Aviation Enforcement Orders issued to date related to IROPS events Lessons Learned related to IROPS Communication & Coordination		
ID#	**Date/ Location**	**Description**
19	**January 2015**	• **Research Approach:** Review of Enforcement Order. • **Background & Overview of Event:** Carrier failed to adhere to the assurance in its contingency plan for lengthy tarmac delays that it would not permit a domestic flight to remain on the tarmac for more than 3 hours without providing passengers an opportunity to deplane. • **Problem/Solutions:** Cease and desist from future similar violations. • **Key Highlights:** Carrier stated that numerous flights were delayed due to local weather conditions and that a malfunction of its crew scheduling system and unexpected shortage of staff, particularly the carrier's ramp crew, resulted in inability to clear and prepare gates for arriving flights in a timely manner. The results were sixteen flights exceeding the 3-hour limit. • **Best Practice & Lessons Learned:** (a) Periodic training by carriers should include all decision-making personnel and should address all aspects of tarmac delay communication and coordination. • **Special Tools/Items to Share:** None identified.

Table 9 – U.S.DOT Aviation Enforcement Actions References.

U.S.DOT Aviation Enforcement Actions		
ID#	**Date/ Location**	**Reference**
1	November 2009	http://www.dot.gov/sites/dot.gov/files/docs/eo_2009-11-17.pdf http://www.dot.gov/sites/dot.gov/files/docs/eo_2009-11-18.pdf
2	November 2009	http://www.dot.gov/sites/dot.gov/files/docs/eo_2009-11-16.pdf
3	November 2011	http://www.dot.gov/sites/dot.gov/files/docs/eo_2011-11-13.pdf
4	August 2012	http://www.dot.gov/sites/dot.gov/files/docs/eo_2012-8-25.pdf
5	September 2012	http://www.dot.gov/sites/dot.gov/files/docs/eo_2012-9-21.pdf
6	December 2012	http://www.dot.gov/airconsumer/eo-2012-12-18
7	December 2012	http://www.dot.gov/airconsumer/eo-2012-12-20
8	February 2013	http://www.dot.gov/sites/dot.gov/files/docs/eo_2013-2-9.pdf
9	March 2013	http://www.dot.gov/sites/dot.gov/files/docs/eo_2013-3-15.pdf
10	May 2013	http://www.dot.gov/sites/dot.gov/files/docs/eo_2013-5-3.pdf
11	July 2013	http://www.dot.gov/sites/dot.gov/files/docs/eo_2013-7-18.pdf
12	August 2013	http://www.dot.gov/sites/dot.gov/files/docs/eo_2013-8-9.pdf
13	October 2013	http://www.dot.gov/sites/dot.gov/files/docs/eo_2013-10-13.pdf
14	November 2013	http://www.dot.gov/sites/dot.gov/files/docs/eo_2013-11-17.pdf
15	January 2014	http://www.dot.gov/sites/dot.gov/files/docs/eo_2014-1-11.pdf
16	April 2014	http://www.dot.gov/sites/dot.gov/files/docs/eo_2014-4-8.pdf
17	May 2014	http://www.dot.gov/sites/dot.gov/files/docs/eo_2014-5-5.pdf
18	October 2014	http://www.transportation.gov/airconsumer/eo-2014-10-23
19	January 2015	https://www.transportation.gov/sites/dot.gov/files/docs/eo-2015-1-10_0.pdf

Appendix A.9 Sample Tabletop Exercise Scenarios, Considerations, and Planning Guide

Tabletop exercises provide the opportunity to fairly and accurately assess the level of readiness of key personnel involved in IROPS response. They also provide the information and means by which airport stakeholders can determine how well current communication and collaboration strategies create common situational awareness during IROPS events. Tabletop exercises should be used to fine tune IROPS contingency plans and ensure consistent understanding of roles and responsibilities. They are also useful in:

- Assessing and validating policies, plans, procedures, training, equipment, assumptions, and interagency agreements.
- Developing interaction between stakeholders.
- Promoting team building and collaboration.
- Identifying/clarifying roles and responsibilities.
- Improving interagency coordination and communications.
- Identifying duplications and gaps in performance.
- Measuring performance, identifying strengths and shortfalls.
- Identifying opportunities for improvement.
- Identifying specific actions critical to response activity.
- Enhancing understanding of new IROPS processes and procedures.
- Validating plans, agreements and training.
- Identifying capacity, capability and communication gaps.

Eight sample tabletop exercises were prepared as part of ACRP Project 10-23, along with the IROPS Tabletop Exercise Planning Guide, which reviews what personnel are essential in planning and facilitating a tabletop exercise, a process for conducting an exercise, and the various forms and sample materials to ensure that tabletops can be planned effectively. The IROPS Tabletop Exercise Planning Guide establishes the components of tabletop exercises to ensure consistent value for participants. This guidance document is intended to be scalable to meet specific airport customer service needs and concerns.

Editable copies of the IROPS Tabletop Exercise Planning Guide, detailed versions of the tabletop scenarios, and blank tabletop exercise documents are provided in the "IROPS Tabletop Planning Guide & Scenarios" folder on **CRP-CD 180** (see **Figure 10**). The documents are provided in separate Microsoft Word documents so airports can easily modify them to tailor to their specific requirements.

Figure 10. Tabletop Information that can be found on CRP-CD 180.

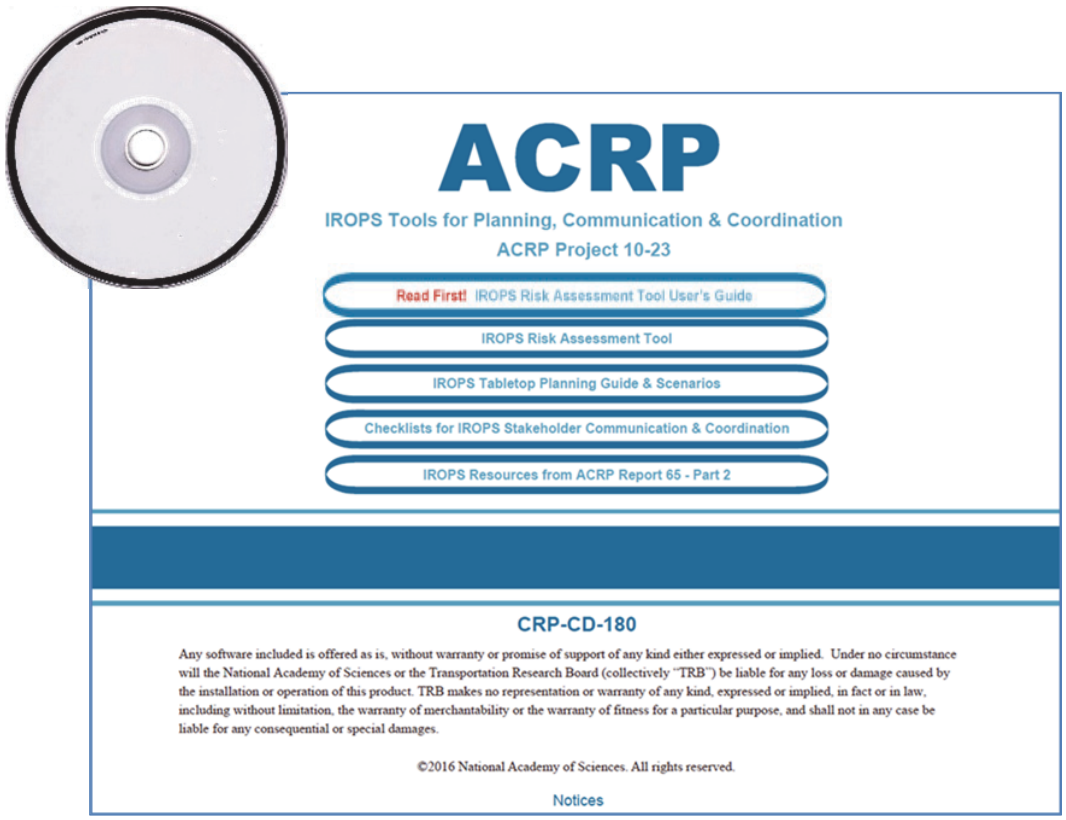
Table 10 lists the tabletop exercises developed as part of ACRP Project 10-23 along with relevant impact details and unique factors included in each scenario. Airports are encouraged to look at the IROPS impact and unique factors in order to choose the appropriate tabletop exercise to meet unique needs. Detailed versions of each scenario are given in the appendices to this Planning Guide, which are provided as customizable Microsoft Word files in the "IROPS Tabletop Planning Guide & Scenarios" folder on **CRP-CD 180**.

Table 10 – Tabletop Exercise Scenarios, IROPS Impacts and Unique Factors.

Tabletop Exercise Name	IROPS Impact	Unique Factors
BEFORE AN IROPS EVENT		
A.9.1 IROPS Stakeholder Familiarization Workshop	✓ Airline Delays ✓ Airline Cancellations ✓ Airline Diversions ✓ Airline Deplanement ✓ Airline Gate/Facility Sharing ✓ Airport Surge ✓ Airport Capacity ✓ Airport Off Hours ✓ Airport Extended Stay	✓ Scenario can be modified to address any type of IROPS event that a small, medium or large hub requires. ✓ Scenario can be used to review winter or summer operations on a semi-annual basis. ✓ Scenario is provided in a workshop format for a region to review major elements of IROPS planning such as developing contact and notification lists, processes for tracking aircraft and review/debriefing recommendations.
DURING AN IROPS EVENT		
A.9.2 Severe Ice	✓ Airline Delays ✓ Airline Cancellations ✓ Airline Diversions ✓ Airline Deplanement ✓ Airline Gate/Facility Sharing ✓ Airport Surge ✓ Airport Capacity ✓ Airport Off Hours ✓ Airport Extended Stay	✓ Considers escalating/changing forecast conditions.
A.9.3 Winter Operations (includes fog)	✓ Airline Delays ✓ Airline Cancellations ✓ Airline Diversions ✓ Airline Deplanement ✓ Airline Gate/Facility Sharing ✓ Airport Surge ✓ Airport Capacity ✓ Airport Off Hours ✓ Airport Extended Stay	✓ Long-term event suited for a large, hub airport. It can be shortened to a 1- or 2-day event for a smaller airport. ✓ Situation features blizzard conditions, extended winter storm with extreme temperatures and fog. ✓ Focuses on need for supplies, additional resources from multiple stakeholders, and issues such as equipment failures and worker fatigue.
A.9.4 Thunderstorm	✓ Airline Delays ✓ Airline Cancellations ✓ Airline Diversions ✓ Airline Deplanement ✓ Airline Gate/Facility Sharing ✓ Airport Surge ✓ Airport Capacity ✓ Airport Off Hours/Extended Stay	✓ Appropriate for a regional training session to understand regional capacity constraints. ✓ Features numerous diversions to various reliever airports.

Tabletop Exercise Name	IROPS Impact	Unique Factors
A.9.5 Hurricane with Tornado	✓ Airline Delays ✓ Airline Cancellations ✓ Airline Diversions ✓ Airline Deplanement ✓ Airline Gate/Facility Sharing ✓ Airport Surge ✓ Airport Capacity ✓ Airport Off Hours ✓ Airport Extended Stay	✓ Features airport closure, terminal power outage/flooding, damage to FIS area, worker safety, staff shortages, passenger injuries, cell phone and Wi-Fi outages, baggage issues, and contaminated water. ✓ Escalating situation provides opportunities to discuss when to trigger IC/NIMS protocols or AEP activation.
A.9.6 Power Outage	✓ Airline Delays ✓ Airline Cancellations ✓ Airline Diversions ✓ Airline Deplanement ✓ Airline Gate/Facility Sharing ✓ Airport Surge ✓ Airport Capacity	✓ Can be modified for small, medium or large hub airport. ✓ Features fire, worker safety, public misinformation, panicked passengers, accidental aircraft emergency evacuation.
A.9.7 International Diversions	✓ Airline Delays ✓ Airline Cancellations ✓ Airline Diversions ✓ Airline Deplanement ✓ Airline Gate/Facility Sharing ✓ Airport Surge ✓ Airport Capacity ✓ Airport Off Hours ✓ Airport Extended Stay	✓ Features aircraft diversion to airport that does not provide service for an airline or its code-sharing partners and no FIS sterile area. ✓ Appropriate for a regional training session to discuss importance of 24/7 contact numbers on a local, regional and national basis. ✓ CBP and FBO involvement.
AFTER AN IROPS EVENT		
A.9.8 Airport Recovery	✓ Airline Delays ✓ Airline Cancellations ✓ Airline Diversions ✓ Airline Deplanement ✓ Airline Gate/Facility Sharing ✓ Airport Surge ✓ Airport Capacity ✓ Airport Off Hours	✓ Scenario evaluates a “mock” event that previously took place. ✓ Scenario includes mock tabletop evaluator forms and customer feedback forms so that participants can fill out After-Action Reporting and make decisions related to updating IROPS plans.

IROPS Tabletop Planning Guide



CONTENTS

* Provided as editable Microsoft Word files in the "IROPS Tabletop Planning Guide and Scenarios" folder on **CRP-CD 180.**

Section 1 Getting Started with Tabletop Exercise Planning

1.1 Introduction

The purpose of this IROPS Tabletop Exercise Planning Guide document is to establish the components of tabletop exercises to ensure consistent value for participants. These components include roles and responsibilities; pre-exercise planning; tailoring scenarios to meet user needs; detailed exercise materials development; evaluation criteria identification, control and evaluation processes; and post-exercise critique and analysis.

This guidance document is intended to be scalable to meet specific airport customer service needs and concerns.

TWO TIPS FOR SUCCESS:

1. HOW TO ENSURE DYNAMIC VS. STATIC SCENARIO DEVELOPMENT: It is important to note that tabletop scenarios should have dynamic components inserted in them that add an element of surprise to participants, driving them to react in real time to an evolving event. This can be accomplished by withholding some scenario "messages" from the tabletop scenario narrative, enabling the facilitator to interject, at various times, changes to the scenario. For example, a thunderstorm tabletop exercise might seem fairly straightforward until the facilitator informs participants the weather front spawned a major tornado that tears the roof off the terminal where passengers were being sheltered in place. This element of surprise will present tabletop participants with unexpected complications, potentially enabling the group to test the efficacy of IROPS plans, agreements, and other related standard operating procedures.

2. HOW TO ENSURE A WELL-MANAGED TABLETOP EXERCISE: To effectively manage a tabletop, a facilitator is needed to guide the exercise and provide dynamic input to ensure continuity of the exercise. This facilitator should be experienced at leading groups in these types of exercises and must be adept at fostering in-depth discussions, enabling slow-paced problem solving. Best practices show that hiring a third-party facilitator with proven experience leading tabletops provides the best opportunity for exercise success.

1.2 IROPS Tabletop Exercise Roles and Responsibilities

Tabletop exercises require personnel to act in several roles. These roles are defined in the following sections and should be filled by stakeholders that understand IROPS events well, primarily those on the IROPS Committee or a subset of that group.

1.2.1 Airport Operator

The Airport Operator's staff are responsible for hosting IROPS Tabletop Planning Committee meetings, facilitating the tabletop exercises, and ensuring sufficient resources are available to support the logistics of tabletop exercises, including physical facilities, equipment, and technical reference materials (flight tracking, surface tracking, weather forecasts, etc.). Physical facilities and equipment may include, but are not limited to, classroom training rooms, simulators, 'smart board' aids, equipment, tools, etc.

The host Airport's Operations Department will usually have operational authority. Therefore, the Chief Operating Officer will normally have oversight responsibility for the activities and responsibilities of the "Airport Operator" role.

1.2.2 IROPS Tabletop Planning Committee

This Committee is primarily comprised of the airport's IROPS Committee members or subset. The purpose of the IROPS Tabletop Planning Committee is to modify one of the sample tabletop exercises, found in the appendices of this document, into a scenario tailored to the specific needs of the stakeholders involved. The Committee assists the Airport Operations/Technical Lead in fine-tuning the technical content and final tabletop scenario, to include developing the schedule.

The individuals assigned to the Committee should have the authority to commit, coordinate, and manage resources necessary to perform the major tasks within their own organizations. Ultimately, members of the Committee should be good candidates to function as either Table Leads or Evaluators during the tabletop exercise.

1.2.3 IROPS Chairperson

This person is normally an employee of the Airport Operator who leads in the customization of the tabletop to meet internal and external organizational needs. This person will assign trained and qualified staff to provide technical support, including the appointment of an Operations/Technical Lead and Tabletop Facilitator. He/she may also serve as the Operations/Technical Lead or Tabletop Facilitator when staffing limitations exist.

1.2.4 Tabletop Facilitator

This person ensures the orderly and timely preparation, conduct and critique of the tabletop exercise. The IROPS Tabletop Facilitator is the single authority for making decisions on exercise discussion, timelines, and continuation of play. He/she also directs the critiques, collects inputs from the IROPS Table Leaders/Evaluators, and assembles the components of the final exercise report. This person may be the IROPS Committee Chairperson (or other IROPS Committee member) or come from an outside organization or contractor.

The Tabletop Facilitator must be familiar with the local detailed IROPS Plan and associated standard operating procedures (SOPs) to be exercised and have a good understanding of the participating internal and external stakeholders. The Tabletop Facilitator reviews the tabletop scenario in advance of the exercise to ensure all objectives can be successfully achieved. The Tabletop Facilitator also conducts the pre-brief with the Table Leaders and Evaluators.

The Tabletop Facilitator is the primary authority for decisions related to initiation, suspension, and termination of any tabletop exercise. The Tabletop Facilitator must be decisive and able to make on-the-spot changes regarding the focus of discussion and appropriate exercise inputs (inject messages) during the conduct of the exercise to maximize educational opportunity.

Further, the Tabletop Facilitator is responsible for ensuring that the critique/debrief process incorporates the Table Leaders/Evaluator inputs and that the evaluation addresses any need for follow-up training and or changes to the IROPS Detailed Plan and SOPs.

1.2.5 Airport Operations/Technical Lead

The Airport Operations/Technical Lead is responsible for tabletop modifications, coordination, conduct, evaluation, and follow-up actions as delineated in this guide and the Airport Operator's approved schedule. He/she serves as the coordinator of the Tabletop Planning Committee meetings, unless otherwise directed. The Airport Operations/Technical Lead is responsible for maintaining all pertinent tabletop information in accordance with the respective local Airport management systems.

1.2.6 Internal/External Staff

Staff members are responsible for supporting the development, coordination, and conduct of all tabletop activities as delineated in this guide and as assigned by the Tabletop Facilitator or Airport Operations/Technical Lead. Specific roles for some staff members are described in the following sections.

1.2.6.1 Table Leaders

The primary responsibility of the Table Leaders is to make certain that the tabletop exercise goes according to plan so that the objectives can be achieved. The number of Table Leaders needed to execute a tabletop exercise is directly related to the scope, objectives, and number of stakeholders. The Table Leaders initiate and direct scenario events by providing timely information as dictated by the scenario or by inquiries from stakeholders. Table Leaders provide scenario information to stakeholders and may be tasked to inject approved messages to keep the tabletop on track with the scenario. To the extent possible, Table Leaders should be drawn from the IROPS Tabletop Planning Committee, whose members are already familiar with the scenario and associated facility operations. They facilitate group discussions by engaging all stakeholders in the process. They also report back about the group discussions to the facilitator.

1.2.6.2 Table Recorders

Table Recorders are assigned to ensure the tabletop remains on schedule—a key factor for achieving learning objectives. The recorder receives and documents information from the Table Leaders pertaining to responses to the question sets. The recorder is co-located with the Table

Leaders and provides support as needed. He/she take notes of group responses to discussion questions and organizes/summarizes group responses for reporting purposes.

1.2.6.3 Evaluators

The Evaluators' function is to observe and document tabletop activities and, more specifically, to document and evaluate stakeholder performance and the adequacy of the training based on established learning objectives.

Section 2 Additional Tabletop Resources

2.1 Planning Tasks and Deliverables Checklist

A designee from the IROPS Tabletop Planning Committee can use the checklist shown on this page to plan a tabletop exercise. The designee should share the completed document with the entire Committee to ensure that responsibilities are understood and completed in a timely manner. An editable template for this checklist is provided in the "IROPS Tabletop Planning Guide & Scenarios" folder on **CRP-CD 180.**

Task – Deliverables	Date Due	Responsible Party	Status
1. PLAN THE EXERCISE (IROPS Committee)			
Identify Airport Operator Requirements for the Exercise			
Determine IROPS Tabletop Planning Committee Members/Send Invitations			
IROPS TABLETOP PLANNING COMMITTEE RESPONSIBILITIES (unless otherwise noted)			
Determine Exercise Date, Mail Save the Date and Develop Planning Schedule			
Develop Budget			
Schedule Tabletop Planning Committee Meetings: Committee Meeting #1			
Committee Meeting #2			
Committee Meeting #3			
2. CUSTOMIZE AND ALIGN SAMPLE TABLETOP EXERCISE SCENARIO			
Modify Tabletop Exercise Scenario			
Review Modified Tabletop Exercise Scenario			
Finalize Modified Tabletop Exercise Scenario			
3. DRAFT THE ASSOCIATED TABLETOP EXERCISE MATERIALS			
Develop Stakeholder Read-ahead Packet			
Develop Team Leader Handbook			
Develop Recorder Handbook			
Develop Evaluator Handbook			
Develop Multimedia Presentation Material			
Review Draft Materials			
Finalize Materials			
4. COORDINATE (Airport Operations/Technical Lead)			
Develop Administration/Logistics Plan			
Determine Table Leader/Evaluator Assignments			
Conduct Pre-Briefings and Pre-Training			
5. CONDUCT THE EXERCISE (Tabletop Facilitator)			
6. EVALUATE THE EXERCISE (Airport Operations/Technical Lead)			
Document Performance/Outcomes			
Conduct Post-Exercise Stakeholder Hotwash			
7. CONDUCT POST-EXERCISE ACTIVITIES (Airport Operations/Technical Lead)			
Develop After-Action Report			
Develop and Issue Corrective Action Plan or SOP			
Track Corrective Actions/Lessons Learned			

2.2 Tabletop Ground Rules

1. Be on time and stay in the tabletop.
2. Respect each stakeholder and share responsibility.
3. Listen, listen, listen—**FOR UNDERSTANDING.**
4. Keep an open mind: question and participate.
5. Criticize only ideas, not people.
6. Be brief and to the point; do not preach to the choir.
7. Keep on track; follow the scenario agenda/timeline.
8. Silence cell phones and pagers.
9. No rank in the room.
10. Silence = assumed consent.

2.3 Sample Evaluator Form

This form will be used by Table Evaluators to observe and document tabletop activities and specifically to document and evaluate stakeholder performance and the adequacy of the training based on established learning objectives. An editable template for this form is provided in the "IROPS Tabletop Planning Guide & Scenarios" folder on **CRP-CD 180.**

2.4 Sample Table Recorder Form

This form will be used by Table Recorders who are assigned to ensure the tabletop remains on schedule. This person will take notes of group responses to discussion questions, and organizes/summarizes group responses for reporting purposes. An editable template for this form is provided in the "IROPS Tabletop Planning Guide & Scenarios" folder on **CRP-CD 180.**

2.5 Read-Ahead Packet and Handbook Outlines

The following is suggested subject matter for participants' use prior to the tabletop exercise. It is to be emailed as a packet to all registered participants.

2.5.1 Read-Ahead Packet for Stakeholders

- Administrative details, including the time, place and duration of the tabletop exercise
- Background about the purpose and objectives of the IROPS tabletop exercise
- Sample agenda for the exercise
- Expectations and preparation required
- Ground rules

2.5.2 Handbook for Table Leaders/Evaluators/Recorders

- Introduction
- Schedule of events
- Purpose and scope
- Instructions for exercise conduct
- Roles and responsibilities for Facilitator and participants
- Assumptions and artificialities
- Tabletop exercise ground rules

- Information necessary to support the discussion-based exercise
- Scenario narrative
- Issues for consideration (key questions to be discussed during the IROPS Event)
- Appendices for Stakeholders and, Leaders/Evaluators/Recorders
  - Exercise Stakeholder roster
  - Exercise evaluation criteria
  - Observation form
  - Blank participant feedback form
  - Additional background information (i.e., IROPS Plan, triggers, agreements, MOUs, SOPs, etc.)

2.6 Sample Participant Feedback Form

This form is to be used by all participants involved in a tabletop exercise. An editable template for this form is provided in the "IROPS Tabletop Planning Guide & Scenarios" folder on **CRP-CD 180.**

2.7 Sample Administration/Logistics Plan

This section provides an example of an Administration/Logistics Plan for a tabletop exercise. The example is **generic** and requires the addition of airport-specific information. The Sample Administration/Logistics Plan is prepared for the purpose of ensuring that the requisite administrative and logistics activities associated with the IROPS tabletop planning, preparations, conduct, and follow-up are accomplished. It consists of a series of checklists for use by the exercise planning organization. An editable template for this sample plan is included in the "IROPS Tabletop Planning Guide & Scenarios" folder on **CRP-CD 180.**

IROPS Tabletop Materials

PRE-EXERCISE

Development Requirements
To be approved by the Tabletop Planning Committee:

- ☐ Scope
- ☐ Objectives
- ☐ Scenario narrative
- ☐ Tabletop exercise data
- ☐ IROPS Tabletop exercise/scenario evaluation
- ☐ Administration and logistical planning

Production and Distribution Actions

- ☐ Produce final plan
- ☐ Develop distribution list
- ☐ Distribute the plan
- ☐ Gain concurrence of participating stakeholders (list each for check-off purposes)
- ☐ Develop tabletop exercise materials
- ☐ Distribute tabletop exercise materials

Meeting Preparations Checklist

- ☐ Schedule date and time
- ☐ Identify number of attendees
- ☐ Define meeting purpose and expected outcomes
- ☐ Schedule training room
- ☐ Schedule audio/visual equipment
- ☐ Develop agenda
- ☐ Publish and distribute exercise announcement
- ☐ Registration for stakeholders, evaluators, and other guests complete
- ☐ Arrange for food/drinks
- ☐ Produce handouts or other support materials
- ☐ Arrange for recorder for taking minutes
- ☐ Ensure room setup
- ☐ Produce sign-in sheet
- ☐ Produce draft of minutes
- ☐ Finalize and distribute minutes
- ☐ Complete Badging

Final Logistics Checklist

- ☐ Pre-exercise meeting schedule published
- ☐ Pre-exercise meetings (use meeting checklist)
- ☐ Evaluators, Table Leaders, Facilitator, and other personnel identification means pre-staged
- ☐ Simulation aids are set up and tested (i.e., smart board, flight, and weather data)

POST-EXERCISE

Administration/Logistics Checklist

- ☐ Stakeholder rosters collected
- ☐ Critique checklist distributed and collected
- ☐ Evaluator sheets collected
- ☐ IROPS training records of all stakeholders updated
- ☐ Hotwash conducted
- ☐ After-Action Report developed, approved, and published
- ☐ Corrective Action Plan developed, approved, and published
- ☐ Findings added to IROPS Plans and associated SOPs or triggers
- ☐ Track corrective actions and lessons learned

Approval

PREPARED BY: _____ DATE: _____
Operational/Technical Lead

APPROVED BY: _____ DATE: _____
Tabletop Facilitator

2.8 Sample After-Action Report Format

This type of report is useful for all types of tabletop exercises independent of scenario. It is a means to collect information from tabletop exercises in order to make changes and improvements to current IROPS mitigation practices. An editable template for this sample report is provided in the "IROPS Tabletop Planning Guide & Scenarios" folder on **CRP-CD 180.**

Tabletop After-Action Report (AAR)
Conducted on
MM/DD/YY

I. Executive Summary
- Strengths
- Areas for improvement

II. Exercise Overview
- IROPS Tabletop Name/Scenario
- Duration
- Date
- Location
- Airport Operator (or other entity hosting the tabletop)
- Scenario
- Participating organizations/stakeholders
- Number of stakeholders
- Tabletop overview
- Tabletop evaluation criteria

III. Exercise Objectives

IV. Exercise Events Synopsis
- Scenario
- Timeline

V. Evaluation Results: *(detailed findings for each objective supported by documentation)*
- Positive comments – what went well?
- Negative comments – what needs to be improved?

VI. Conclusions/Recommendations/Corrective Actions

2.9 Sample Corrective Action Tracking Form

An editable template for this sample form is provided in the "IROPS Tabletop Planning Guide & Scenarios" folder on **CRP-CD 180.**

TRACKING NO.	**DATE ENTERED:**
Responsible Manager:	
Organization/stakeholder:	
Phone:	
IROPS Exercise Date:	
Short Description of Finding:	
Detailed Description of Corrective Action:	
Estimated Completion Date: ***For Internal Use Only***	
Entered By/Date: _____ Date Action Completed: _____	

Detailed Scenarios*

Appendix A.9.1 IROPS Stakeholder Familiarization Workshop Tabletop Scenario
Appendix A.9.2 Severe Ice Tabletop Scenario
Appendix A.9.3 Winter Operations with Fog Tabletop Scenario
Appendix A.9.4 Thunderstorm Tabletop Scenario
Appendix A.9.5 Hurricane with Tornado Tabletop Scenario
Appendix A.9.6 Power Outage Tabletop Scenario
Appendix A.9.7 International Diversion Tabletop Scenario
Appendix A.9.8 Airport Recovery Tabletop Scenario

* Provided as editable Microsoft Word files in the "IROPS Tabletop Planning Guide & Scenarios" folder on **CRP-CD 180.**

APPENDIX B

During an IROPS Event

The following tool and checklist are useful during an IROPS event:

Appendix B.1 IROPS Readiness Checklist
Appendix B.2 Social Media Checklist

Appendix B.1 IROPS Readiness Checklist

The tool in **Table 1** can be used to assess readiness by making sure all stakeholders understand triggers for activating responsibilities during an event.

Table 1 – IROPS Readiness Checklist.

Action	Trigger Events Examples	Responsible Party	Target Group(s)	Communication Method
Anticipate	*Be on the lookout for:*			
	Extreme weather			
	Natural disasters			
	Reduction of airport facility capacity			
	Power outages			
	Aircraft mechanical problems			
	Airline system outages			
	Labor issues			
	ATC system outages			
	Other			
Mitigate	*Execute plans/procedures related to:*			
	Passenger needs			
	Gate and equipment needs			
	Deplaning requirements			
	Busing/transportation needs			
	Deicing coordination			
	Regional airports coordination			
	Other			
Adapt	*Be flexible and innovative related to:*			
	Unplanned aircraft arrivals			
	Ability to meet passenger needs (e.g., serve pizza to stranded passengers)			
	Availability of CBP and TSA			
	Other			

An editable Microsoft Word version of this checklist can be found in the **Checklists for IROPS Stakeholder Communication & Coordination** on **CRP-CD 180.**

Appendix B.2 Social Media Checklist

Current social media technology provides opportunities for airports to quickly notify a broad range of employees and other service providers in order to implement planned IROPS mitigation procedures. In addition, passengers often use social media to relay comments and video when they personally experience IROPS events, often putting the affected airports and airlines on the defensive. This challenges airports to make sure they are monitoring the right media platforms in order to respond to passenger comments with accurate information, while mitigating event impacts.

Below is a checklist to use for implementing social media into an airport's communication planning. It is divided into things to do before, during and after an IROPS event.

BEFORE AN IROPS EVENT

1. **Create an IROPS Social Media Plan** to ensure you remain a credible resource for information during IROPS events with the public and with other stakeholders. Ensure you do the following:
   - ☐ **Develop internal protocols**
     - ☐ Identify probable IROPS events for your airport.
     - ☐ Identify "trigger points" for your response on social media vs. allowing others to lead.
     - ☐ Create timing protocols with airlines and other stakeholders.
   - ☐ **Develop standardized messages**
     - ☐ Create generic messages for typical IROPS situations that your airport has had or may encounter.
     - ☐ Match the social media platforms with the appropriate messages.

2. **Designate an area as a Public Information Center (PIC):**
   - ☐ Establish/identify a location for a communication center that can monitor and respond on social media.
   - ☐ Develop a staffing plan for the PIC.

DURING AN EVENT

3. **Communicate the following:**
   - ☐ Potential impacts to the public and the airport community, employees, and service providers
   - ☐ Terminal operation status (e.g., surge, capacity, extended delay, after hours)
   - ☐ Status of airline(s) schedules (flight delays, cancellations, diversions)
   - ☐ Airfield status (open/closed)
   - ☐ Employees' logistics and human factors (staff availability, shifts, lodging, transportation to/from work, food)
   - ☐ Impacts to service providers (FBOs/ground handlers/deicing, etc.)
   - ☐ Guidance for service providers (implement SOPs, activate MOAs, etc.)

4. **Remove pre-scheduled posts:**
   - ☐ Remove unrelated and discordant pre-planned posts.

5. **Categorize incoming posts:**

   ☐ Develop a system for categorizing posts (e.g., Tier 1-urgent, Tier 2-as time allows, Tier 3-monitor/re-route).

6. **Respond:**

   ☐ Respond in kind; be proactive with your messaging and include updates to employees.

7. **Stay "on message."**

   ☐ Don't boast about yourself or critique others and don't speculate on the event. Stick to the current and pertinent facts. Stay focused on what has happened.

8. **Be flexible:**

   ☐ Listen to how people are reacting to your responses and update your replies based on that information.

9. **Don't stop communicating altogether; just minimize your messaging:**

   ☐ Take note of when your audience resumes regular posting before you return to your regular posting schedule.

Some case study recommendations related to social media use during IROPS events includes:

- *Use Twitter to communicate emerging situation information, providing links to more information and advice.*
- *Provide rapid response to Tweets and post about the situation through response Tweets.*
- *Re-Tweets by other service providers involved in IROPS Events can assist in keeping messages consistent.*
- *Use Facebook to monitor activity escalation and sentiment using rapid response to rebut inaccurate reporting.*

POST- IROPS EVENT: RECOVERY AND DEBRIEF FOR CONTINUOUS IMPROVEMENT

10. **Analyze, measure, and follow up:**

    ☐ Create a dashboard for keywords, customer names, and user names for follow-up after the IROPS event.

    ☐ Institute analytics that continue to track any backlash from the IROPS event.

An editable Microsoft Word version of this checklist can be found in the **Checklists for IROPS Stakeholder Communication & Coordination** on **CRP-CD 180.**

Appendix B-2

APPENDIX C

After an IROPS Event

The following tools and checklist are useful after an IROPS event:

Appendix C.1 Recovery Checklist
Appendix C.2 Debriefing Assessment Checklist
Appendix C.3 Continuous Improvement Accountability Checklist

Appendix C.1 Recovery Checklist

Post-IROPS event recovery efforts should be performed immediately following an IROPS event. Planning for these efforts with stakeholders and assigning roles and responsibilities ahead of time will help mitigate long-term impacts on airport operations and passenger care (see **Table 1**).

Table 1 – Recovery Checklist.

Recommended Action	Due for review	In Progress	Completed
Appoint IROPS Recovery Team Lead responsible for overseeing the airport recovery activities.	☐	☐	☐
Determine essential criteria and processes for IROPS Capacity + Capability Assessment. Include: • Airport assets • Airport equipment • Service failures and lapses • After-hours staffing resources and gaps • Communication issues • Procedure refinement • Operations and maintenance restocking (deicing fluid, concessions, and other) • New capital items requisitions • Coordination with ground handler(s) and fuelers	☐	☐	☐
Organize a team of airport stakeholders to carry out after-action inventory assessment for airport capacity. Consider including equipment from FBOs and ground handlers that may need to be repaired or replaced.	☐	☐	☐
Provide IROPS After-Action Report to the IROPS Contingency Response Committee and appropriate stakeholders that includes a timeline of the event, response assessment, and estimated costs.	☐	☐	☐

An editable Microsoft Word version of this tool can be found in the **Checklists for IROPS Stakeholder Communication & Coordination** on **CRP-CD 180.**

Appendix C.2 Debriefing Assessment Checklist

Determining how an airport and stakeholders view their performance during an IROPS event provides additional insight into where improvement can be made during the debriefing process. The assessment checklist shown in **Table 2** provides a look at IROPS preparedness on a scale from reactive to optimized and can provide an IROPS Planning Evolution Assessment over time.

Table 2 – Debriefing Assessment Checklist.

Ranking Scale and Descriptors	May 2012	Current	Following IROPS Assessment
Reactive (1) • Minimal/ad hoc plans and procedures • Chaotic in an IROPS event	☐	☐	☐
Defined (2) • Basic DOT IROPS Plan defined and documented • Primary focus is on response and communication	☐	☐	☐
Proactive (3) • Consistent execution of IROPS response • Event management processes in place • Detailed IROPS Coordinated Plan	☐	☐	☐
Managed (4) • Metrics collected and reviewed • Cross-organization support and action • Proactive social media	☐	☐	☐
Optimized (5) • IROPS Planning Program integrated throughout airport and region – including all diversion airports • Collaboration technology embraced	☐	☐	☐

An editable Microsoft Word version of this tool can be found in the **Checklists for IROPS Stakeholder Communication & Coordination** on **CRP-CD 180.**

Appendix C.3 Continuous Improvement Accountability Checklist

Research as part of this project found that many airports are conducting follow-up assessments of IROPS performance with stakeholders, and are documenting recommended changes, but they have not been as successful incorporating changes into plans and training. This can be traced to a lack of accountability measures in place to ensure lessons translate into new policies and practices.

As a means to assist stakeholders with this issue, the following Continuous Improvement Accountability Checklist has been developed.

1. **Host a debriefing session:**
   - ☐ Debrief with stakeholders as soon as possible following an IROPS event.

2. **Develop an After-Action Report or Action Register List (see sample below):**
   Be sure the list includes:
   - ☐ Details related to the problem encountered
   - ☐ The action(s) needed to remedy the problem
   - ☐ The names of personnel needed to remedy the problem
   - ☐ The names of personnel needed to update planning and training

3. **Host follow-up meetings:**
   - ☐ Host After-Action Report or Action Register follow-up meetings on a regular basis to discuss progress made.
   - ☐ Continue holding meetings and log progress until:
     - ☐ Individuals assigned to remedy problem have done so
     - ☐ Individuals assigned to make plan updates and distribute changes have done so
     - ☐ Individuals assigned to design and facilitate training have done so

Sample Action Register

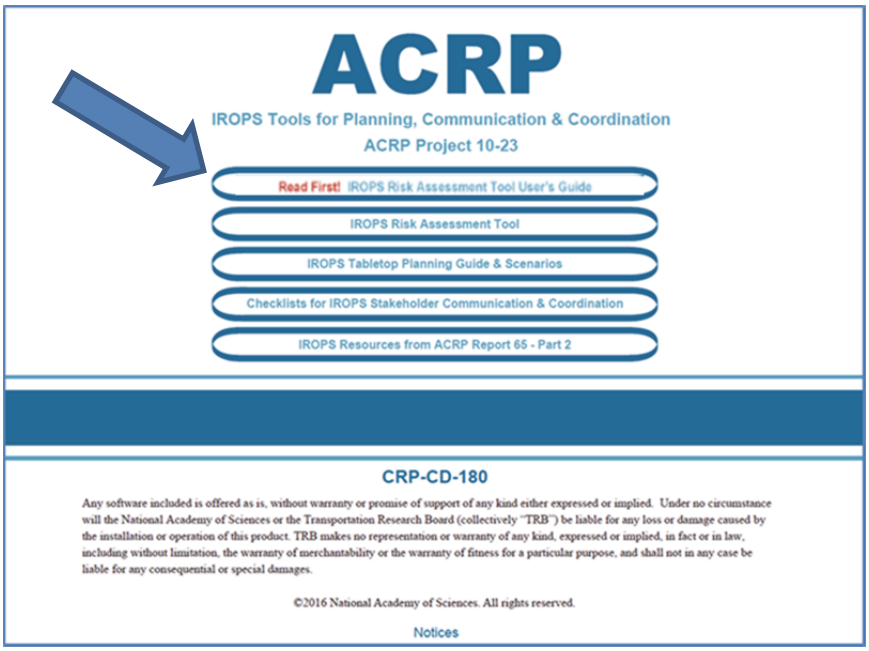
Problem Identified	Action Required	Responsibility	Date Due	Progress Log (Date/Action(s) Taken)

An editable Microsoft Word version of this checklist can be found in the **Checklists for IROPS Stakeholder Communication & Coordination** on **CRP-CD 180.**

PART 2

IROPS Risk Assessment Tool User's Guide

For users' convenience, the User's Guide also is provided as an electronic file on **CRP-CD 180.**



IROPS Risk Assessment Tool User's Guide

Barbara Cogliandro
Rafal Kicinger
Ed Masterson
Giles O'Keeffe
Metron Aviation, Inc.
Washington, DC

Rose Agnew
J. Michael Nash
Christina Coverdell
Aviation Innovation, LLC
St. Paul, MN

Tim Anderson
Anderson Consulting, LLC
Eden Prairie, MN

Richard Marchi
RFMarchi Aviation Consulting, Inc.
Washington, DC

Justin Phy
Barich, Inc.
Richmond, TX

Tim Callister
Mead & Hunt, Inc.
Minneapolis, MN

Contents

Tables

Figures

Tables and Figures in Appendices

Section 1 Introduction

1.1 Purpose of the Irregular Operations (IROPS) Risk Assessment Tool

The IROPS Risk Assessment Tool (herein referred to as The Tool) is a Microsoft Excel-based series of worksheets designed to support airport stakeholders (Stakeholders) in assessing their preparedness for IROPS events, and in evaluating and improving IROPS mitigation plans. The Tool was created to help improve the reliability of an airport's IROPS mitigation plans by improving communication and coordinaton. Attaining reliability in IROPS mitigation plans can help an airport of any size.

Note: A **Quick Reference Guide** for The Tool has been provided in **Appendix C** of this User's Guide; however, it is strongly suggested that each user read the entire IROPS Risk Assessment Tool User's Guide before attempting to use The Tool for the first time.

The Tool has been designed to address these key objectives:

- *Support airport Stakeholders in assessing Stakeholder preparedness for IROPS events;*
- *Highlight weaknesses and strengths in IROPS impact migration plans;*
- *Provide a means of improving communications among Stakeholders; and*
- *Prioritize investments of time, responsibility and capital needed for response capability.*

1.2 Why Use The Tool

The tool has been created to help improve the reliability of the airport's IROPS mitigation plans. Attaining reliability in IROPS mitigation plans will help an airport meet U.S. Department of Transportation (U.S.DOT) and Federal Aviation Administration (FAA) regulatory requirements. Reliability will also help an airport maintain a positive public image by responding successfully during severe IROPS events. Finally, in addition to providing useful training materials, applying the process described in this Users Guide will offer airports the opportunity to use the experience of its Stakeholders to gain "best practices" for mitigating impacts from IROPS.

Expected results are that airports will use *ACRP 153: Guidebook for IROPS Stakeholder Communication & Coordination* and the IROPS Risk Assessment Tool (The Tool) to help them achieve the following:

- *Meet U.S.DOT & FAA regulations by linking project guidance to specific Airport Tarmac Delay Contingency Plan requirements*
- *Protect against potential loss of their public image by being better prepared for response to an IROPS event*
- *Leverage industry best practices by using The Tool to prioritize investments of time, responsibility, and capital needed for response capability*

It is also expected that airlines and other organizations involved in IROPS response planning will consider using The Tool.

1.3 How The Tool Works

The Microsoft Excel-based tool consists of a series of files that are linked by formulas. A Risk Coordinator must be identified and given the responsiblity for understanding how The Tool works, maintaining all worksheets, and acting as the manager of all procedures involved with The Tool. The Risk Coordinator initially populates The Tool, determines and describes one or more past IROPS events to be assessed, and selects the appropriate airport Stakeholders to receive automatically generated worksheets for their input. Stakeholders then individually assign severity and probability to each event and describe mitigation plans that will reduce severity in the provided worksheet. Stakeholders will send their completed worksheets back to the Risk Coordinator, who then links all comments together in a report that identifies IROPS event risks for each of the impact areas. Step-by-step details are provided for Risk Coordinators in **Section 7** of this User's Guide and for Stakeholders in **Section 8**.

1.3.1 What The Tool Can Do

The Tool can focus Stakeholders' attention on improvements that can be made to plans to mitigate the impact from IROP events. It can help users fully realize what resources are available at the airport and the best way to use them. Using The Tool can also enhance communication among Stakeholders by facilitating automated exchanges of information on past events and establishing common awareness of planned mitigation strategies for future events. The Tool's outputs will help to identify airports' shortfalls in mitigating impacts from IROPS and decisions that need to be made to improve IROPS response plans.

Specific focus areas include:

- *Focus stakeholders on improving mitigation plans,*
- *Focus on enhancing communications, and*
- *Focus on reducing airport resource shortfalls.*

1.3.2 What The Tool Cannot Do

The Tool does not include an objective process for weighing the severity of IROPS' impact nor for selecting the likelihood that the impact will reoccur. The user must make that determination subjectively, based upon analyzing historical data. The Tool cannot assess the effectiveness of current or future IROPS mitigation plans, it cannot warn the user when mitigation plans of multiple Stakeholders conflict or exceed available resources, nor can it advise the user when to enact mitigation plans. The Tool does not generate training plans, but the outputs are highly suitable for use as training materials.

Section 2 Explanation of Terms

Hazard – A condition that can lead to injury, illness, or death to people; damage to or loss of a system, equipment, or property; or damage to the environment.

Irregular Operations (IROPS) Event – An exceptional event that requires actions and/or capabilities beyond those normally considered by aviation service providers. The event may be caused by any disruption, such as extreme weather, natural disaster, a facility or equipment outage, labor issues, etc., that results in an impact on passengers.

Severity – The measure of how serious the results of an event are predicted to be. Severity is determined by the worst credible outcome and is measured in degrees. The degrees of severity used in The Tool are Extreme, Significant, Moderate, Minor, and Minimal.

Likelihood – A degree of probability; the chance of something happening.

Mitigation Plan – A method of handling risk, worked out in advance, in order to make the potential impact of the risk less harsh, severe or violent.

Safety Management System (SMS) – The formal, top-down, organization-wide approach to managing safety risk and ensuring the effectiveness of safety risk controls. It includes systematic procedures, practices, and policies for the management of safety risk.

Safety Risk Management (SRM) – A process within the SMS composed of describing the system; identifying the hazards; and analyzing, assessing and controlling risk.

Section 3 Guidance for Tool Users

3.1 Before Starting – Pre-plan

The Risk Coordinator should prepare to use The Tool by first gathering data. Data are necessary to populate The Tool prior to involving Stakeholders. Data will help establish a history of an airport's IROPS events and allow expedited communication and shared situational awareness regarding IROPS impacts. The value of The Tool's output is dependent on a common assessment of what happened to whom and a measurement of the impact backed up by data. Two main categories of data are required:

1. Data pertaining to the completion of an airport profile—recorded in the **Airport Profile** worksheet, and
2. Data pertaining to the historical information surrounding IROPS events—recorded in the **IROPS Event History** master worksheet.

Data associated with an airport profile can come from resource inventory lists or various airport reports. Data associated with a particular IROPS event can come from debriefing notes and from flight or weather data. The balance of this section describes where the Risk Coordinator can obtain this information. In addition, The Tool requires a common measurement system that defines both IROPS Severity levels and their likelihood of occurrence in a way that is backed up by data. For more detail, see **Section 4** of this User's Guide.

NOTE: When first establishing an airport profile, it is recommended that the Risk Coordinator prioritize IROPS risk assessments related to specific stakeholder organizations when building the airport's initial data baseline. The recommended priority groupings are:

1. Stakeholder organizations associated with compliance with U.S.DOT regulations:
    a. Airport operations
    b. Local airline station managers
    c. Local Transportation Security Administration (TSA) organization
    d. Local Customs and Border Protection (CBP) organization
2. Other Stakeholder organizations that are members of the airport's IROPS Contingency Response Committee:
    a. Other airport organizations
    b. Local FAA organizations
    c. Local military operations (if joint-use facility)
    d. Fixed-base operators(FBOs)/ground handlers/aircraft refueling company
3. All other Stakeholder organizations identified as associated with local airport:
    a. Airport operations (at regional airports)
    b. Airline station managers (at regional airports)
    c. Airline operations centers
    d. Cargo airlines (at local airport)
    e. Other FAA organizations
    f. Other TSA organizations
    g. Other CBP organizations
    h. Centers for Disease Control and Prevention (CDC)

i. Local police/local fire departments
j. Local transportation
k. Local hotels/motels
l. Other local support/mutual aid Stakeholders/U.S. Department of Agriculture (USDA)/local veterinary clinics
m. Passengers aboard aircraft/in terminal/arriving – departing airport

3.1.1 Toolbox of Resources for the Airport Profile

The Risk Coordinator is responsible for completing The Tool's **Airport Profile** worksheet. This worksheet defines who leads the airport's IROPS risk coordination, what airlines are airport Stakeholders, and which resources the airport and Stakeholders can access for the purposes of IROPS mitigation. The Risk Coordinator can access various airport plans, standard operating procedures (SOPs), and/or the airport's IROPS Plan to complete the worksheet. For additional support, the Risk Coordinator can consult similar documentation or refer to **Tool 7 – Example Resource Inventory Checklist** in *ACRP Report 65* – Part 2 – Resources, on **CRP-CD 180.** The data collected can be useful to Stakeholders when preparing mitigation plans.

3.1.2 Toolbox of Resources for the IROPS Event

Any records that feature a post-analysis of IROPS events or document airport resources will be useful for the Risk Coordinator when completing the **IROPS Event History Summary** worksheet and entering information related to an IROPS event in The Tool. These records may come from notes taken from an after-event debriefing session.

Additionally, the Risk Coordinator can refer to the following topics and tools from *ACRP Report 65: Guidebook for Airport Irregular Operations (IROPS) Contingency Planning:*

- **Tool 6 – Self-Assessment Questionnaire:** Stakeholders can use this document to build or modify their IROPS mitigation plans.
- **Tool 9 – Airport/Airline 24/7 Contact and Capability Summary:** Stakeholders can use this to gain insight on how to develop their IROPS mitigation plans.
- **Topic 6b – Capturing Lessons Learned and Updating Plans:** Any documentation, records or minutes from post-IROPS-event analysis or meetings will be useful to Risk Coordinators for selecting IROPS events to analyze and to stakeholders in assessing past performance during an IROPS event.
- **Tool 17 – After an Event Debrief:** The Risk Coordinator can use this to determine which IROPS events to select for risk assessment. The Risk Coordinator, along with the Stakeholders, can use this to determine the type of impact resulting from the event.

All of these topics and tools can be accessed from **CRP-CD 180** by clicking the button labeled "ACRP Report 65 – Part 2 – Resources" and opening the Word files for **Resource A** (Topics) or **Resource C** (Tools).

If an airport does not have all pertinent details related to an IROPS event, various flight data and weather-related resources are available, including:

- Flight Data Resource: Aviation System Performance Metrics (ASPM), and
- Weather Data Resource: National Climatic Data Center.

3.1.3 Flight Data Sources

Numerous federal and non-federal sources of flight data are available today. The most useful data sources come from FAA and the National Oceanic and Atmospheric Administration (NOAA). These two agencies generate many reports that provide data for airport analysis: taxi time data; scheduled flights; current, forecasted and historical weather; etc. This User's Guide describes two sources that will be particularly useful when assessing IROPs events. It also includes more information on federal and non-federal flight data sources.

3.1.3.1 Aviation System Performance Metrics (ASPM)

The ASPM**,** an FAA product, offers many useful reports. **Figure 1** shows a sample screenshot from the ASPM site at https://aspm.faa.gov/asqp/sys/Airport.asp.

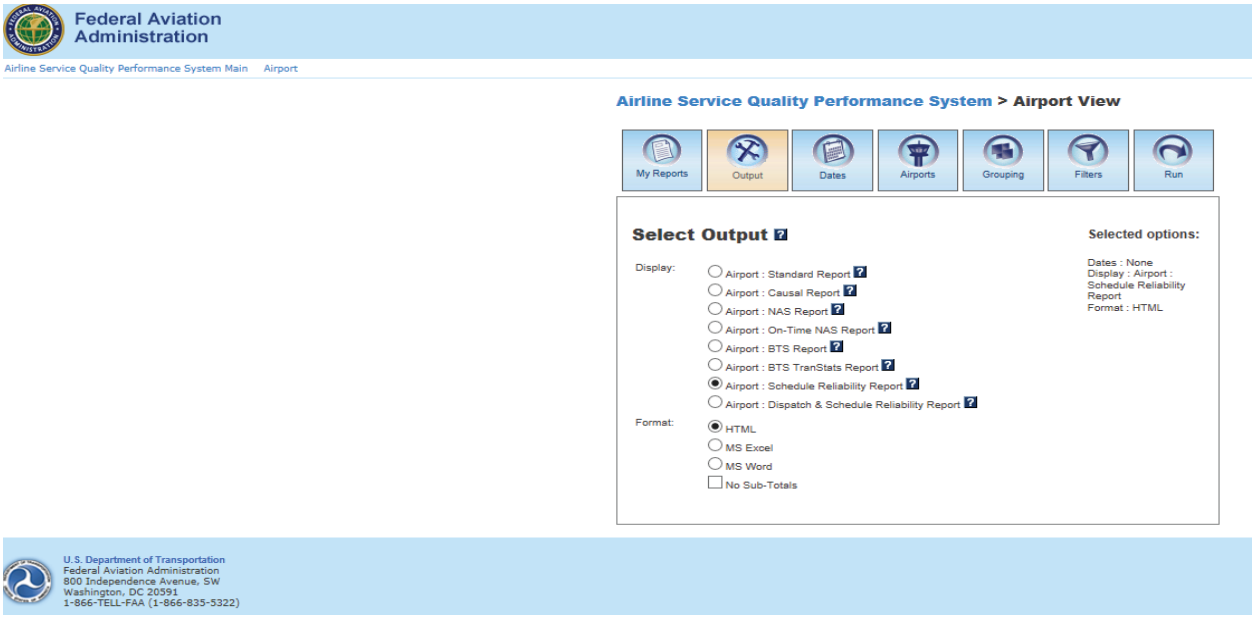


Figure 1. The FAA's ASPM website provides many useful reports (https://aspm.faa.gov/asqp/sys/Airport.asp).

The ASPM products include a detailed Diversion Report that includes the flights, point of origin, carrier, type of aircraft, and time of diversion. Non-FAA personnel do not have direct access to the Diversion Reports, but the information may be available through an airport's local FAA Air Traffic Control facility. **Caution: Air Traffic Control Facilities may not take kindly to receiving multiple requests for the same information. Requests for this data should be limited to one Airport Operations representative.**

3.1.3.2 National Climatic Data Center

Having historical weather data for the airport or region may be helpful in refreshing memories about a particular event or in establishing weather trends in the geographical area. NOAA provides an extensive list of sites for historical, current, and forecasted weather. NOAA's National Climatic Data Center website offers extensive historical data and is also very user friendly. **Figure 2** shows a screenshot from this website; the web address is: http://gis.ncdc.noaa.gov.

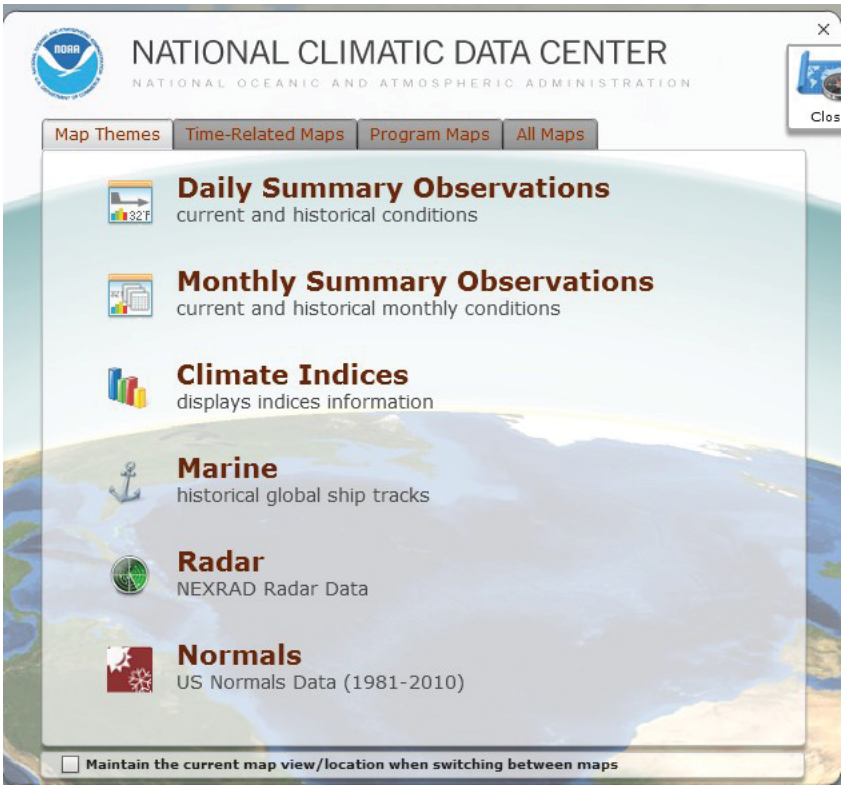


Figure 2. The National Climatic Data Center website provides weather trending information (http://gis.ncdc.noaa.gov).

Figure 3 shows a sample of NEXRAD Radar data available through the NOAA site for a selected date and time.

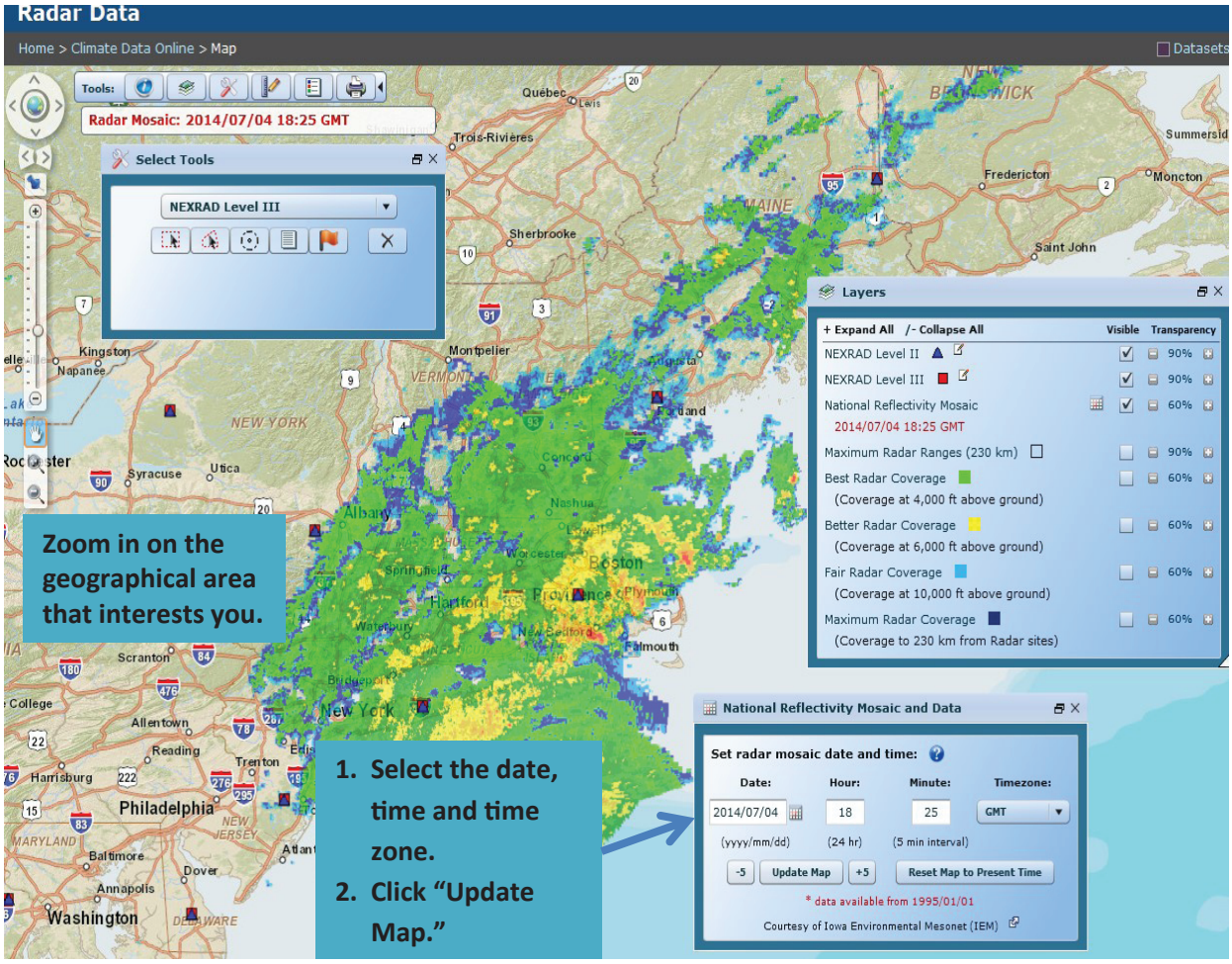


Figure 3. Enter parameters to view NEXRAD radar data (http://gis.ncdc.noaa.gov).

Section 4 Determining Severity and Likelihood

Ideally, each Severity and Likelihood level should be defined with values that can be supported by data. In reality, however, determining the severity of the impacts of a past IROPS event and forecasting the likelihood of its reoccurrence is often subjective. The Risk Coordinator and each Stakeholder will have independent ideas of what constitutes *Extreme, Significant, Moderate, Minor,* or *Minimal* impact. The same is true for Likelihood levels. An event with an impact that occurs once a month may be determined to be *Frequent* by one Stakeholder, whereas another Stakeholder may consider that type of reoccurrence to be *Probable* or even *Remote.* Therefore, definitions have been provided in this section as an attempt to assist the Risk Coordinator and Stakeholders in achieving consistency and objectivity when using The Tool.

The Tool uses a traditional model that combines probability with impact. Five (5) levels of Severity and Likelihood (probability) have been exclusively designed for this Tool. The Tool also features three (3) Risk levels—Red, Yellow, and Green.

In **Section 4.1**, **Table 1** describes the Severity levels and features "Indicators" that mark a threshold for each Severity level. Indicators also apply to the Likelihood levels shown in **Section 4.2**, **Table 2**.

It is important to remember that one size does not fit all airports. Therefore, it is recommended that the tables provided be used as a guide and that, when using The Tool, the Risk Coordinator determine the Indicators that best address the airport's particular characteristics.

Establish a Common Approach to Assessing Risk:

- Establish a baseline understanding among Stakeholders and Risk Coordinators of the Severity and Likelihood values.
- Determine the Severity and Likelihood indicators that best suit the specific airport. Some suggested indicators are included in the User's Guide or users can devise their own.
- Severity levels described here have been established uniquely for the IROPS Risk Assessment Tool (The Tool).

4.1 Severity Levels

The five (5) Severity levels that were designed for The Tool are listed in the first column in **Table 1**. They range from "Minimal" to "Extreme." An IROPS event's Severity level chosen by a Risk Coordinator or Stakeholder should contain most or all of the Descriptors (second column) and Indicators (third column) for that Severity level.

Table 1. Descriptions of five Severity levels.

Severity Level	Descriptors	Indicators
Extreme	• Very High Significant Impact • IROPS plan was ineffective • Impact occurred over a prolonged period of time	• Tarmac rule violation(s) • Lack of suitable gates on a continuing basis • Depletion of critical asset, such as deicing fluid; • Passengers stranded in terminal; resources such as mats; chairs; concessions, hotel rooms etc. were exhausted • Rolls over into next day as at least a Significant impact • Recovery to full schedule takes 24 hours or longer
Significant	• Significant Impact • IROPS plan was mostly ineffective • Impact occurred over a long period of time	• Tarmac rule violation • Stranded passengers; resources not efficiently allocated • Gate shortage causing cascading delays and cancelations • Recovery to full schedule takes more than 8 hours
Moderate	• Some Impact • IROPS Plan was mostly effective • Impact lasted several hours	• Large number of miss-connecting passengers • On time performance below 70% • Moderate number of cancellations • Recovery to full, published schedule within 8 hours
Minor	• Minor Impact • IROPS Plan was effective with few issues • Impact lasted a few hours	• Some passenger inconvenience • Minor loss of revenue • Minor additional costs for rescheduled air and ground crews • Recovery to full published schedule within a few hours
Minimal	• Minimal Impact • IROPS Plan was completely effective • Impact was of short duration	• A few delays, but on-time performance remains above 80% • No lost revenue • Very minor cost increases • Full published schedule operated (i.e., no canceled flights)

4.2 Likelihood Levels

The five (5) Likelihood levels designed for The Tool are listed in the first column of **Table 2**. They range from "Extremely Improbable" to "Frequent." An IROPS event's Likelihood level chosen by a Risk Coordinator or Stakeholder should feature at least one Indicator from the second, third, or fourth column in order to qualify at that level. The numbers of operations and enplanements indicated in Table 2 are a guide, but may be too large to apply to some non-hub and general aviation (GA) airports. Users should develop a scale that best suits their operation.

Table 2. Indicators of five Likelihood levels.

Likelihood Level	Indicator	Indicator	Indicator
Frequent	Expected to occur routinely	Expected to occur more frequently than once per week	Occurs once every month or 3,000 aircraft operations or 25,000 enplanements
Probable	Expected to occur often	Expected to occur about once every month	Occurs once every year or 34,000 aircraft operations or 300,000 enplanements
Remote	Expected to occur infrequently	Expected to occur about once every year	Occurs once every 5 years or 170,000 aircraft operations or 1,500,000 enplanements
Extremely Remote	Expected to occur rarely	Expected to occur once every 10–100 years	Occurs once every 10 years or 340,000 aircraft operations or 3,000,000 enplanements
Extremely Improbable	So unlikely that it is not expected to reoccur but it is not impossible	Expected to occur less frequently than once every 100 years	Occurs once every 10+ years or 340,000+ aircraft operations or 3,000,000+ enplanements

Section 5 Organizational Planning

Identifying which Stakeholders need to be involved in the process is an important component of using the IROPS Risk Assessment Tool (The Tool). U.S.DOT and FAA regulations dictate who is required to participate in IROPS planning but others, if included, can provide added value to the process.

5.1 Organizational Planning Priority

- Stakeholders required to meet U.S.DOT and FAA regulations:
  - Airlines (both those serving the airport and those who have identified the airport as a reliever airport)
  - Airport Operations (as needed to provide for deplanement, sharing of facilities and providing sterile areas as required)
  - TSA and CBP representatives
- Others on the IROPS Response Planning Committee
- All others identified as related Stakeholders

What Stakeholders must be included in IROPS planning and what Stakeholders should be included.

- **Must Be Included:**
  - Those required to meet U.S.DOT and FAA regulations:
    - Airlines,
    - Airport Operations, and
    - TSA and CBP representatives.
- **Should Be Included:**
  - Others on the IROPS Response Planning Committee, and
  - Others identified as related Stakeholders.

Section 6 Using The Tool

File management is an important part of using The Tool. This, as well as minimum system requirements, are discussed fully in **Appendix D – Minimum System Requirements and File Management**. Please review that section prior to using The Tool. If you are an Excel 2013 user, please see **Appendix E – Special Instructions for Microsoft Excel 2013 Users.**

Section 7 IROPS Risk Coordinator's Inputs

The process for Risk Coordinators using The Tool is discussed in this section. **Appendix C** of this User's Guide contains a **Quick Reference Guide** for following the steps below; however, it is strongly suggested that Risk Coordinators read the entire User's Guide before using The Tool for the first time.

7.1 Overview

The process of risk assessment utilizing The Tool begins with the Risk Coordinator's inputs into the Excel file labeled **IROPS Risk Tool – Coordinator.** The Risk Coordinator should become familiar with the structure of the file before creating any actual inputs to the file. Open the file named "**IROPS Risk Tool – Coordinator.xlsm"** (see **Figure 4**).

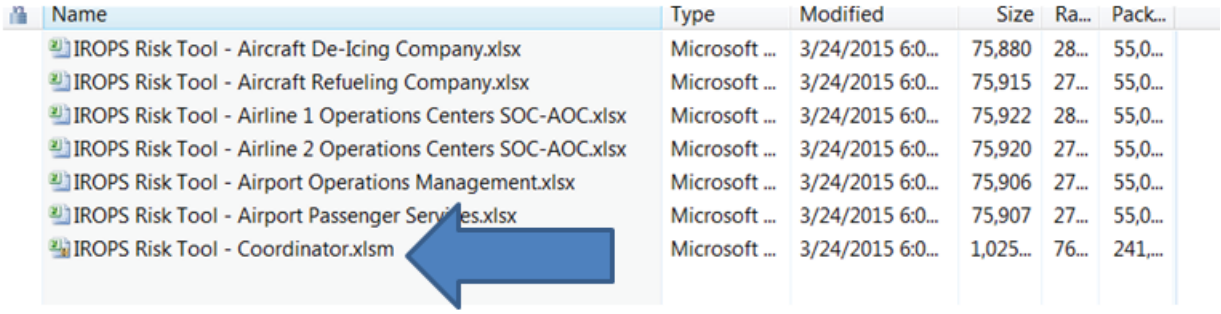


Figure 4. Open the IROPS Risk Tool - Coordinator.xlsm file.

Click on the worksheet named **Overview,** which shows the contents of the Coordinator's file. Each title provides a shortcut (link) to the remaining worksheets, as seen in the next screenshot (**Figure 5**).

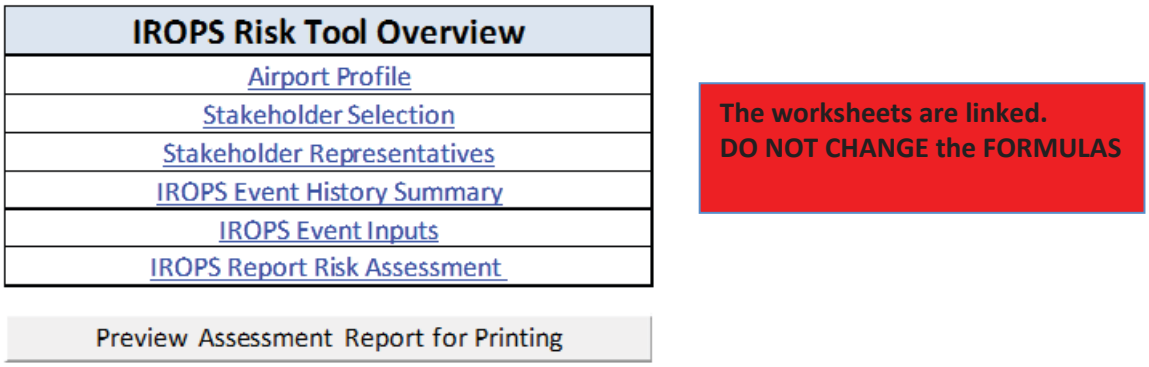


Figure 5. Overview lists are linked to worksheets.

Following are brief descriptions of the worksheets contained in the Risk Coordinator's file. More detail will follow in the step-by-step process for using the worksheets.

Airport Profile – This worksheet should contain the data Stakeholders need to be aware of when determining their mitigation plans for IROPS impacts. The data included here will paint a picture of an airport's capabilities in the event of IROPS events and will help identify an airport's level of preparedness for IROPS. The Risk Coordinator will only need to create the **Airport Profile** once. However, it should be updated as necessary (i.e., when changes occur at an airport, such as when new or additional field equipment is added to an airport's assets, a change in airline service occurs, etc.).

Stakeholder Selection – This worksheet features a pre-established list of possible Stakeholders, categorized into several Stakeholder Groups, and the filename for each individual Stakeholder. The Risk Coordinator may select all or some of the Stakeholders to participate in the risk assessment process by selecting "Yes" for all that apply. The selected Stakeholder's files will be auto-populated with information the Risk Coordinator inputs into the **IROPS Event History Summary.**

Stakeholder Representatives – This worksheet provides a place for the Risk Coordinator to maintain a list of Stakeholders and their representative's names. A preliminary list of organizations has already been populated; however, the Risk Coordinator may add to the list as necessary. These are the Stakeholders to whom the Risk Coordinator will transmit files. The designated Stakeholders will be responsible for assessing IROPS mitigation plans and assigning a Severity level and likelihood of reoccurrence level to the impact experienced during the IROPS event(s) selected by the Risk Coordinator.

IROPS Event History Summary – This worksheet also is populated by the Risk Coordinator. Using past IROPS events, the Risk Coordinator must name the event and input a brief description. He or she will also select the type of airport and/or airline impacts caused by each IROPS event.

IROPS Event Inputs – This worksheet is a compilation of the Stakeholder's assessment of the severity and likelihood of reoccurrence of the impact experienced during the IROPS events that were selected by the Risk Coordinator both before and after mitigation plans.

IROPS Report Risk Assessment – This worksheet is a summary sheet, showing all Stakeholders' individual IROPS Response Plan Inputs.

Preview Assessment Report for Printing – This menu button on the **Overview** worksheet of the Risk Coordinator's file allows the Risk Coordinator to print out reports.

With this information, users are ready to begin the process of utilizing the IROPS Risk Assessment Tool (The Tool). Always remember to save your work.

It is recommended that the Risk Coordinator open each worksheet, examine it, and become familiar with it before attempting to populate it.

7.2 Risk Coordinator's Steps

Step 1 – Gather information as described in **Section 3.1 Before Starting – Pre-plan**, and determine the past IROPS event(s) to be assessed. The events selected should have resulted in significant operational impact, including impact on Passengers. **Appendix B** of this User's Guide lists of types of IROPS events and impacts. Risk Coordinators will need the date of the event, as well as enough information to be able to write a brief description, including the cause and what type of impact the event had on the airport. Later, in Step 4, the User's Guide describes where in The Tool the Risk Coordinator enters the data.

Step 2 – In Microsoft Excel, open the **Coordinator file** (named "IROPS Coordinator.xlsm") and open the **Airport Profile** worksheet. Fill in the information for the airport (see **Figure 6**).

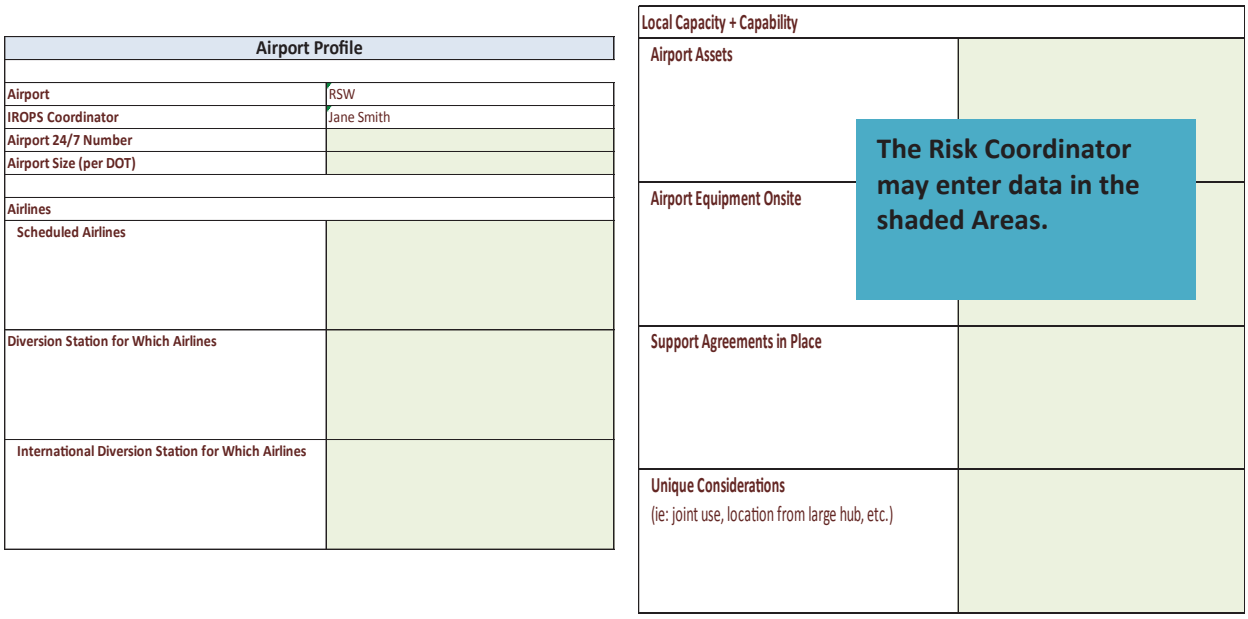
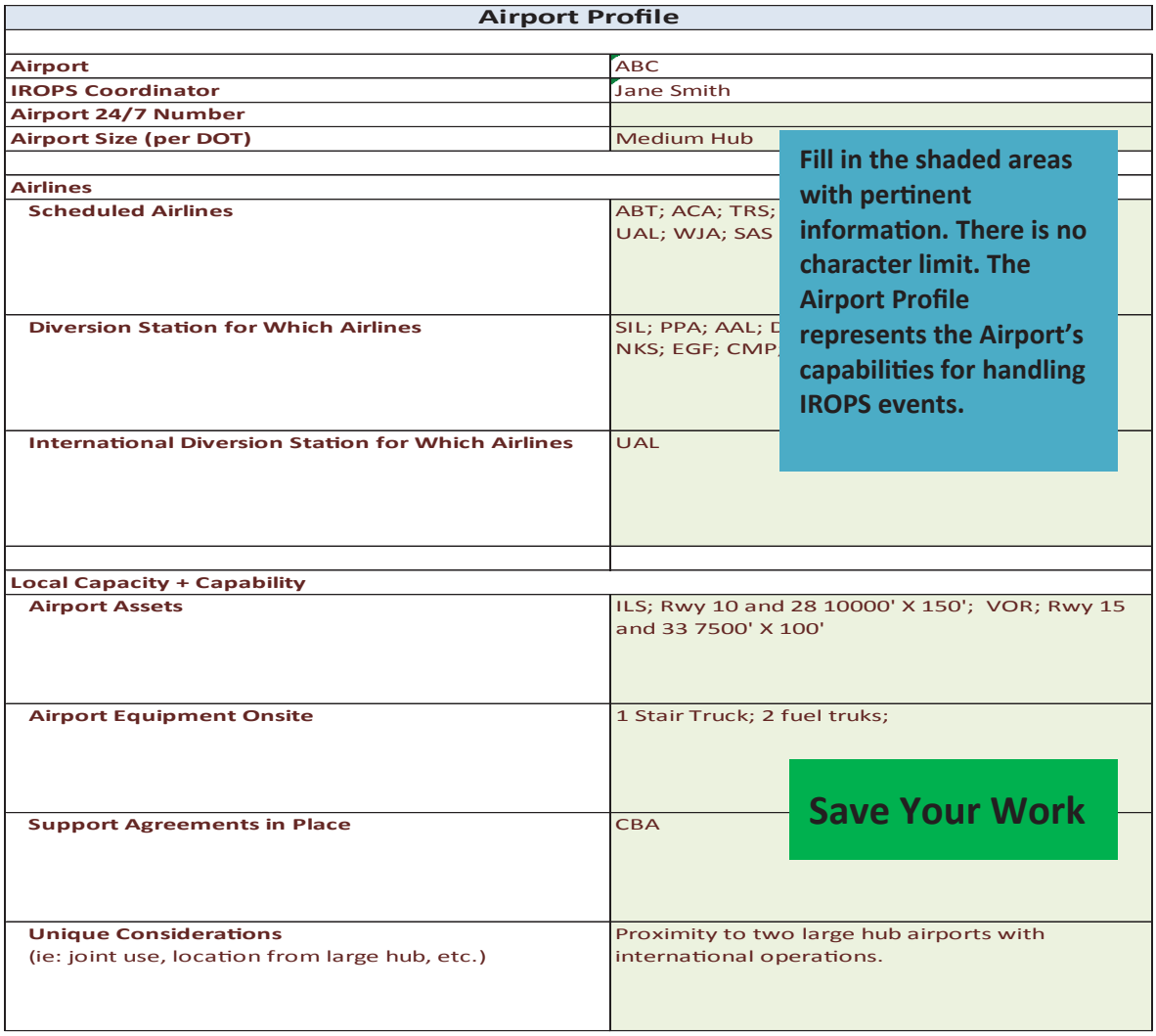


Figure 6. Enter information in the Airport Profile worksheet.

Note: The **Airport Profile** worksheet may be accessed in two ways: (1) by clicking on the link in the Overview tab, or (2) by clicking directly on the "Airport Profile" tab at the bottom of the IROPS Coordinator file.

Figure 7 shows a sample of the type of information that can be recorded in the **Airport Profile.** This profile can be as extensive as the Risk Coordinator chooses.



Airport Profile	
Airport	ABC
IROPS Coordinator	Jane Smith
Airport 24/7 Number	
Airport Size (per DOT)	Medium Hub
Airlines	
Scheduled Airlines	ABT; ACA; TRS; UAL; WJA; SAS
Diversion Station for Which Airlines	SIL; PPA; AAL; D NKS; EGF; CMP
International Diversion Station for Which Airlines	UAL
Local Capacity + Capability	
Airport Assets	ILS; Rwy 10 and 28 10000' X 150'; VOR; Rwy 15 and 33 7500' X 100'
Airport Equipment Onsite	1 Stair Truck; 2 fuel truks;
Support Agreements in Place	CBA
Unique Considerations (ie: joint use, location from large hub, etc.)	Proximity to two large hub airports with international operations.

Figure 7. Sample Airport Profile.

Step 3 – Open the **Stakeholder Selection** worksheet (available by clicking on the second link in the Overview tab or by clicking on the third tab at the bottom of the Excel document). To complete the worksheet, select the Stakeholders who were directly impacted by the IROPS events selected for this exercise (see **Figure 8**). These should be the Stakeholders who took, or should have taken, some actions to mitigate the impact. On this worksheet the "Airport Name" will already have been populated. For each Stakeholder, use the shaded drop box to select "Yes" or "No". Doing this will automatically create files for the selected Stakeholders.

(a) Plus signs on the opening page are used to expand rows, opening drop-down menus through which details can be added.

	A	C	D	E	F
1 2 3					
	1				
	2	ABC			
	3				
	4	Stakeholder Group	Yes / No		Stakeholder Filename
+	5	AIRPORT			
+	20	3rd PARTY TERMINAL OPERATIONS			
+	23	FBO / DE-ICING / FUELER			
+	28	AIRLINES			
+	230	FAA			
+	235	TSA			
+	238	CBP			
+	241	LOCAL ENFORCEMENT			
+	243	OTHER EXTERNAL AGENCIES			
+	252	PASSENGERS			
+	256	OTHER STAKEHOLDERS			

Click the plus signs to expand the rows.

(b) A drop-down menu (shown for the expanded "Airport" row) shows Stakeholders listed for this Stakeholder Group. The Risk Coordinator clicks in the shaded area in the column at left to select "Yes" or "No" for each Stakeholder.

(Airport Name)	
Stakeholder Group	Yes / No
AIRPORT	
Airport Executive Management	No
Airport Operations Management	No
Airport Airside Management	No
Airport Landside Management	No
Airport Terminal Management	No
Airport Emergency Operations / Communications	No
Airport Passenger Services	No
Airport Maintenance	No
Airport Police	No
Aircraft Rescue & Firefighting (ARFF)	No
Airport Pet Relief Area Contact	No
Airport Concessions	No
Airport Public Relations	No
Airport Technology	No
3rd PARTY TERMINAL OPERATIONS	
FBO / DE-ICING / FUELER	
AIRLINES	
FAA	
TSA	
CBP	
LOCAL ENFORCEMENT	

Stakeholder Filename
IROPS Risk Model - Airport Executive Management
IROPS Risk Model - Airport Operations Management
IROPS Risk Model - Airport Airside Management
IROPS Risk Model - Airport Landside Management
IROPS Risk Model - Airport Terminal Management
IROPS Risk Model - Airport Emergency Operations-Communications
IROPS Risk Model - Airport Passenger Services
IROPS Risk Model - Airport Maintenance
IROPS Risk Model - Airp
IROPS Risk Model - Airc
IROPS Risk Model - Airp
IROPS Risk Model - Airp
IROPS Risk Model - Airp
IROPS Risk Model - Airp

Selecting "Yes" will generate links to the IROPS Event History files for the selected Stakeholders.

(c) In the left column of the "Airlines" drop down menu, the Risk Coordinator also has the option to assign the names of specific airlines to "Airline 1," "Airline 2," and so forth. ***Names in the right column must not be changed.***

AIRLINES	
Airline 1	
Airline 1 Station Manager (local airport)	No
Airline 1 Station Manager (regional airports)	No
Airline 1 Operations Centers SOC/AOC	No
Airline 1 Chief Pilot's	
Airline 2	
Airline 2 Station Mana	
Airline 2 Station Mana	
Airline 2 Operations C	
Airline 2 Chief Pilot's	
Airline 3	

Airline 1
IROPS Risk Model - Airline 1 Station Manager-Local
IROPS Risk Model - Airline 1 Station Manager-Regional
IROPS Risk Model - Airline 1 Operations Centers SOC-AOC
sk Model - Airline 1 Chief Pilots Office
sk Model - Airline 2 Station Manager-Local
sk Model - Airline 2 Station Manager-Regional
sk Model - Airline 2 Operations Centers SOC-AOC
sk Model - Airline 2 Chief Pilots Office
Airline 3

The Risk Coordinator may enter the names of airlines in the left column if desired, but DO NOT ALTER THE STAKEHOLDER FILENAMES IN THE RIGHT COLUMN!

Figure 8. Complete the Stakeholder Selection worksheet.

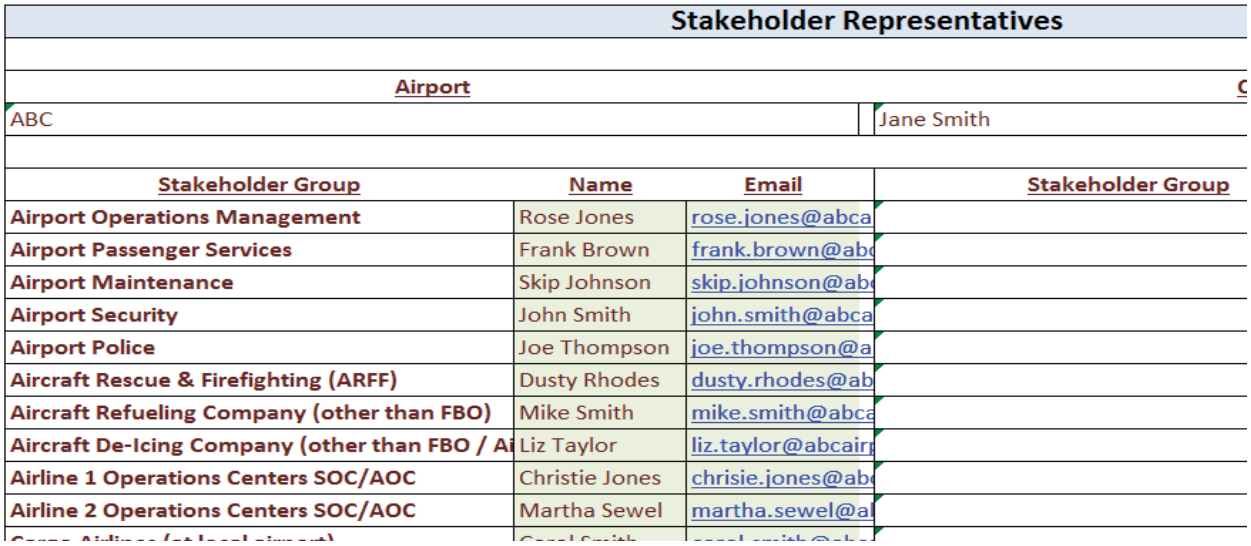
Important: Do not change the Stakeholder file names that appear in the right column. Any changes to these file names will interrupt the processing within The Tool.

It is recommended that users create a key, such as the one shown in **Table 3**, to keep track of the various airlines/Stakeholder groups.

Table 3. Sample Airline/Stakeholder Groups key.

Stakeholder	Name
Airline 1	American Airlines
Airline 2	Delta Air Lines
Airline 3	FEDEX
Airline 4	United Airlines

Step 4 - Open the **Stakeholder Representatives** worksheet by clicking on the third row in the Overview tab or clicking on the fourth tab at the bottom of the Excel document. This worksheet will be populated with the Stakeholders that were selected in Step 3. In the shaded areas, enter the current date (not shown) and the names and email addresses of the Risk Coordinator and each Stakeholder (see **Figure 9**).



Stakeholder Representatives

Airport			C
ABC			Jane Smith

Stakeholder Group	Name	Email	Stakeholder Group
Airport Operations Management	Rose Jones	rose.jones@abca	
Airport Passenger Services	Frank Brown	frank.brown@abc	
Airport Maintenance	Skip Johnson	skip.johnson@abc	
Airport Security	John Smith	john.smith@abca	
Airport Police	Joe Thompson	joe.thompson@a	
Aircraft Rescue & Firefighting (ARFF)	Dusty Rhodes	dusty.rhodes@ab	
Aircraft Refueling Company (other than FBO)	Mike Smith	mike.smith@abca	
Aircraft De-Icing Company (other than FBO / Ai	Liz Taylor	liz.taylor@abcairp	
Airline 1 Operations Centers SOC/AOC	Christie Jones	chrisie.jones@abc	
Airline 2 Operations Centers SOC/AOC	Martha Sewel	martha.sewel@al	

Figure 9. Stakeholder Representatives worksheet.

Step 5 - Describe the IROPS Event using the data gathered in **Step 1**.

Open the worksheet titled **IROPS Event History Summary** by clicking on the fourth row in the Overview tab or clicking on the "Event History Summary" tab in the Excel workbook. With the worksheet open, click on the plus (+) signs to expand rows as needed to add details (see **Figure 10**).

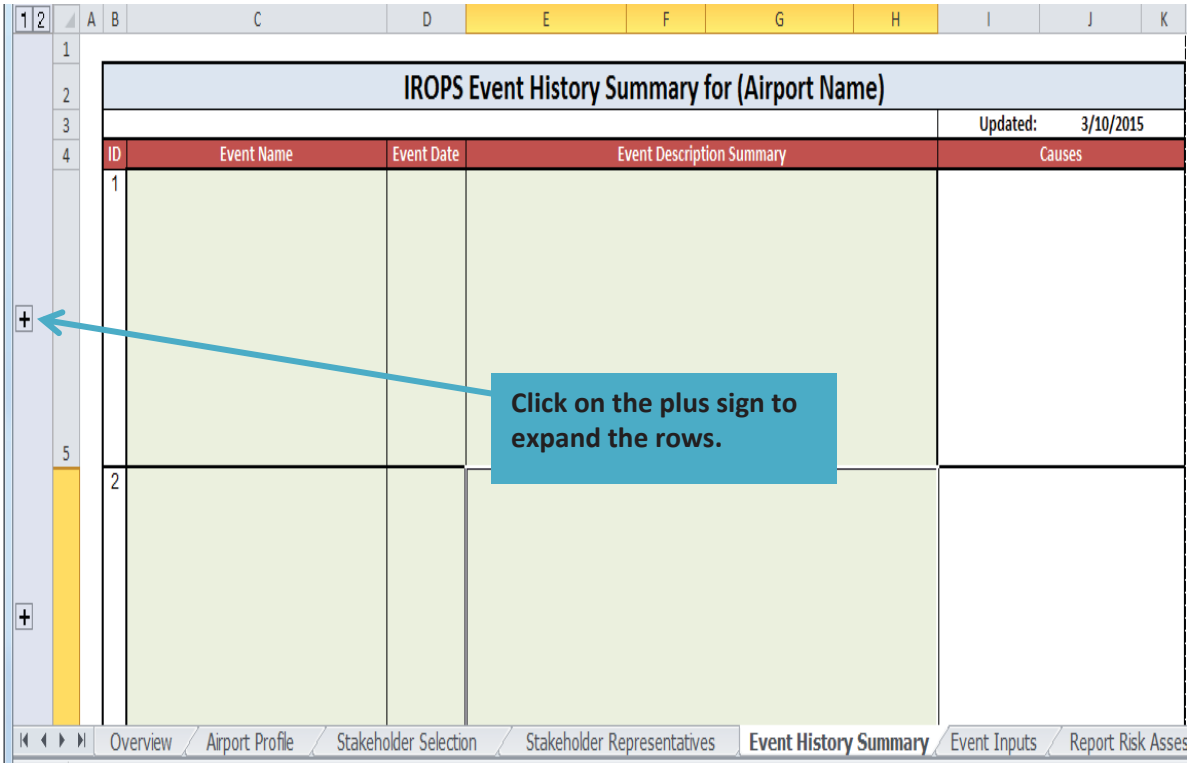


Figure 10. IROPS Event History Summary worksheet.

Enter information about the IROPS event that has been selected for assessment: an "Event Name," "Event Date," a brief description of the event, cause(s) of the event, and the type(s) of impact(s) caused by the event (See **Figure 11**).

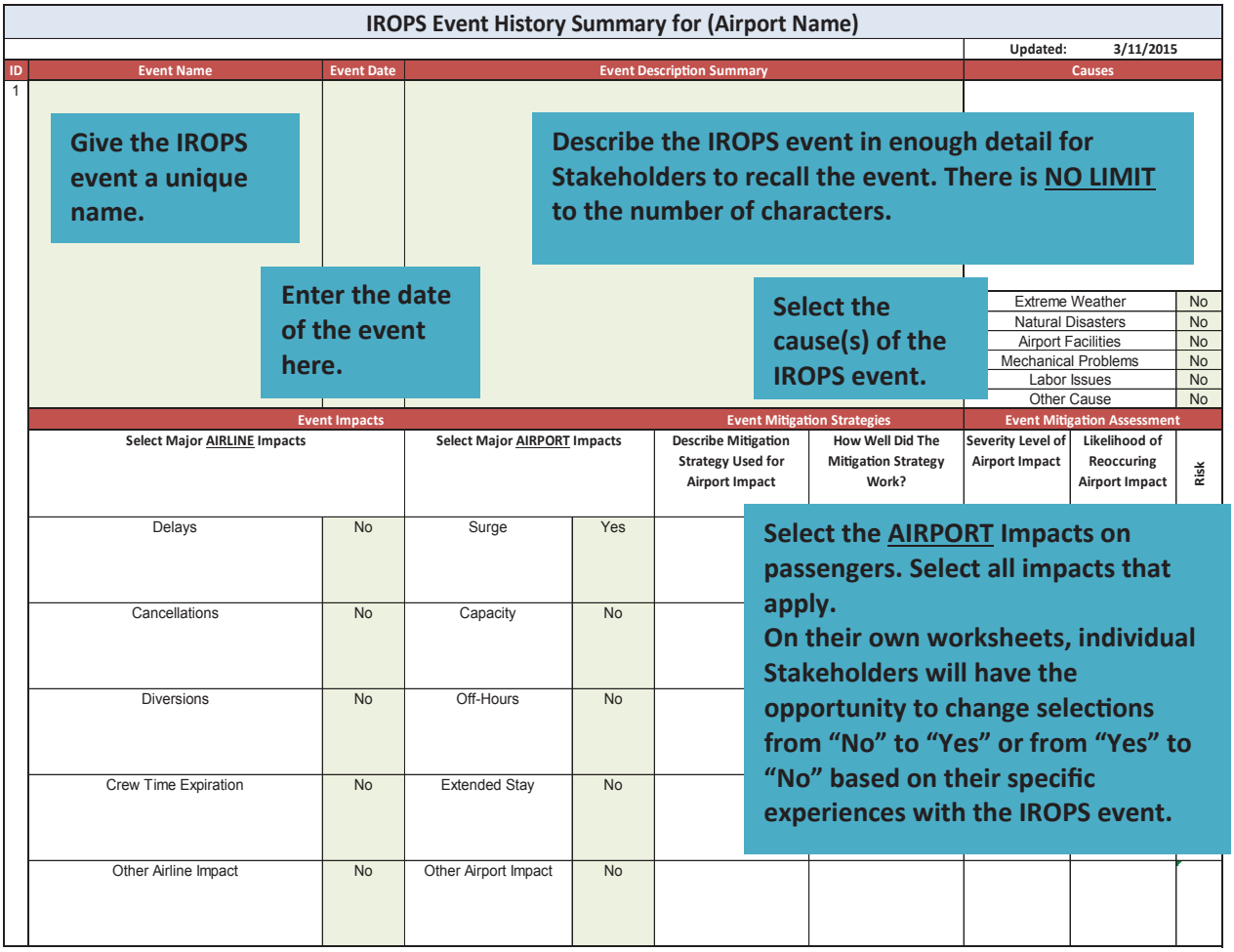


Figure 11. Steps to complete the IROPS Event History Summary worksheet.

Airport impacts are roughly grouped into five categories:

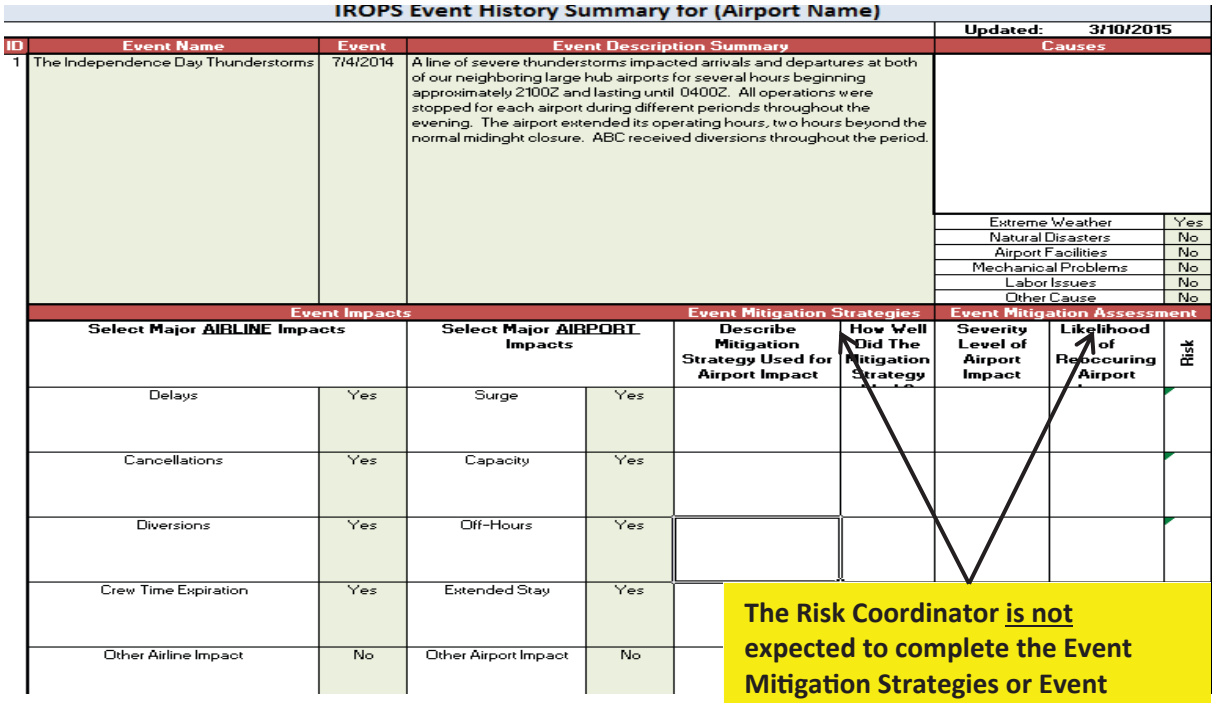
- **Surge –** This category includes the rush of passengers throughout terminals and security areas as well as the volume of aircraft requiring gates due to an IROPS event.
- **Capacity –** This category relates to the ability of a terminal to accommodate the passengers and aircraft either delayed or diverted there. The airport terminal becomes filled with passengers and ramp space/gates become filled with aircraft.
- **Off-Hours –** This category involves conditions that relate to such items as staffing TSA and CBP security area positions beyond normal business hours and ensuring concessions are staffed and stocked appropriately to handle extra passengers who need to deplane during irregular hours.
- **Extended Stay –** This category involves planning to ensure that passengers, especially those with special needs, are accommodated, whether in terminals or off-site at hotels, during events lasting more than 24 hours.
- **Other Airport Impact –** This category includes impacts on airport customers other than passengers and aircraft (e.g., friends and family who are trying to locate arriving passengers).

An airport impact must be selected (have a "Yes" indication) in order to enter mitigation plans or to rate the impact's Severity and Likelihood of reoccurrence. Airline impacts do not drive the risk assessment, so selecting those options will have no bearing on the outcome of the risk assessment. The IROPS Coordinator has the option of including information about airline impacts in order to

lend context to past IROPS events. Repeat Step 5 for all of the events chosen for risk assessment. Save the file. Do not change the file name. Tips on file management and archiving are provided in Appendix D of this Users Guide.

Figure 12 presents a sample scenario in which the Risk Coordinator has described two past IROPS events. The first IROPS event, shown in part (a) of Figure 12, was caused by severe thunderstorm activity. The second IROPS event, shown in part (b) of Figure 12, was caused by an unexpected large snowfall. The Risk Coordinator has selected the airline and airport impacts caused by each IROPS event. Stakeholders will also have the opportunity to determine what types of impacts were triggered by each event.

(a)



(b)

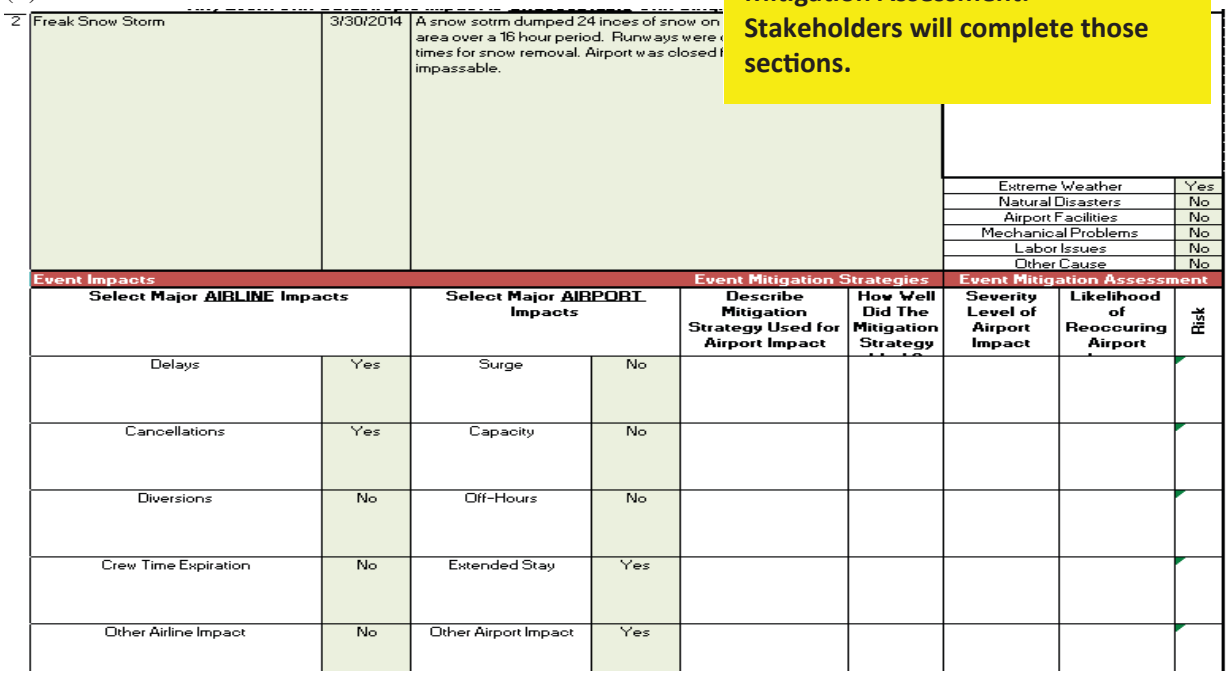


Figure 12. Sample past IROPS events.

Step 6 – Transmit individual files to Stakeholders.

After the Risk Coordinator completes the **IROPS Event History Summary**, he or she (1) opens each Stakeholder file; (2) selects "Enable Content"; and (3) updates and then **saves the file.** Then the Risk Coordinator transmits the individual Stakeholder files via email with instructions to complete the steps in **Section 8** of this Users Guide.

Section 8 Stakeholders' Inputs

The process for Stakeholders using The Tool is discussed in this section. **Appendix C** of this User's Guide contains a **Quick Reference Guide** for following the steps below; however, it is suggested that Stakeholders read the entire User's Guide before using The Tool for the first time.

8.1 Overview

Stakeholders designated by the Risk Coordinator will receive an Excel file containing two worksheets: **IROPS Event History** and **IROPS Report Risk Assessment**. The following is a brief description of the worksheets contained in the Risk Coordinator's file. More detail will follow in the step-by-step process using the worksheets:

- **IROPS Event History –** This worksheet will be automatically populated with the information that has been entered into the **IROPS Event History Summary** by the Risk Coordinator. The Stakeholder may enter comments on the description and may select or de-select the type of airline and airport impact. The Stakeholder's primary role is to briefly describe what mitigation plans were in effect during the event and how successful or unsuccessful they were. The Stakeholder then must make a determination of the severity of the impact and the likelihood that, given the same circumstances and same mitigation plans, the same approximate impacts will reoccur.
- **IROPS Report Risk Assessment –** This worksheet will be automatically populated by the risks identified by the Stakeholders in the **IROPS Event History** worksheet. Each Stakeholder will enter what revisions they can make to their IROPS mitigation plans, then reassess and record the new (or the same) Severity and Likelihood levels. (See **Section 4** in this User's Guide for guidance on defining consistent data-driven values for these factors.) This effort should be considered part of pre-planning for an IROPS event planning session for all Stakeholders.

8.2 Stakeholders' Steps

Step 1 – Open the **IROPS Event History** worksheet (the first worksheet on the Stakeholder file sent by the IROPS Coordinator). This worksheet will be populated with the event descriptions written by the Risk Coordinator and with the airline and airport impact selections selected by the Risk Coordinator.

In **Figure 13**, John Doe is a sample Stakeholder. John has opened the **Airport Operations Management** worksheet in The Tool, which displays the two IROPS events already described by the Risk Coordinator:

1. The Independence Day Thunderstorms; and
2. Freak Snow Storm.

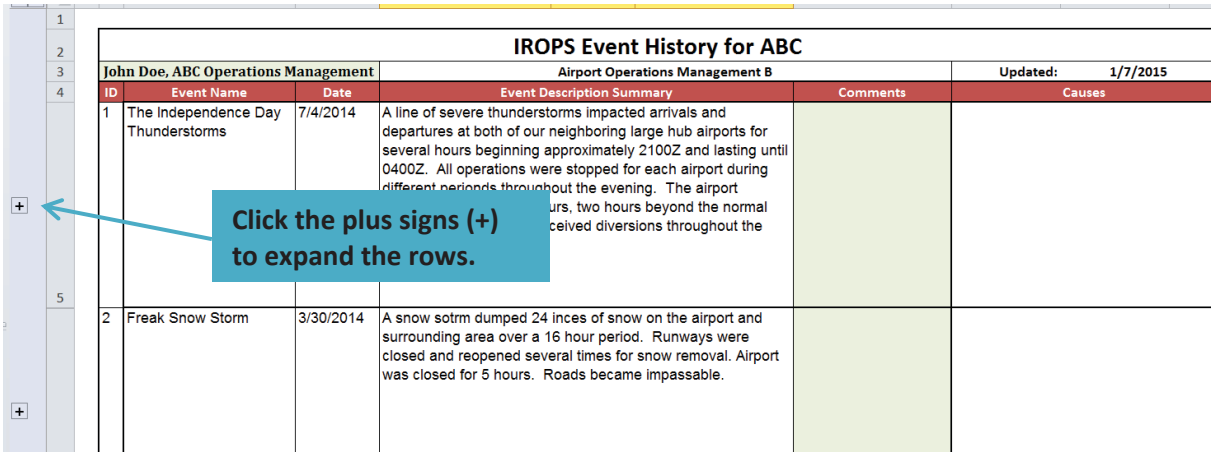


Figure 13. Expand rows on the IROPS Event History worksheet.

Step 2 – Stakeholders may make entries in the shaded cells. (In **Figure 13**, the cells in the "Comments" column appear as shaded areas.) The Stakeholder selects the airline and airport impacts that the Stakeholder considers appropriate for the event. To make a selection, first click the plus signs in the column to the left of each event to expand the rows. A drop-down menu with "Yes"/"No" options will appear (see **Figure 14**). Select "Yes" or "No" for each option.

Note: The Stakeholder is free to change the selections made by the Risk Coordinator. If a "No" is changed to a "Yes," the "Event Mitigation Strategies" and "Event Mitigation Assessment" areas will become shaded, and the Stakeholder can then enter corresponding input. If a "Yes" is changed to a "No," the shading in corresponding areas will disappear, and the Stakeholder may not enter input. **The cells in the "Comments" column always remain shaded (open to input).**

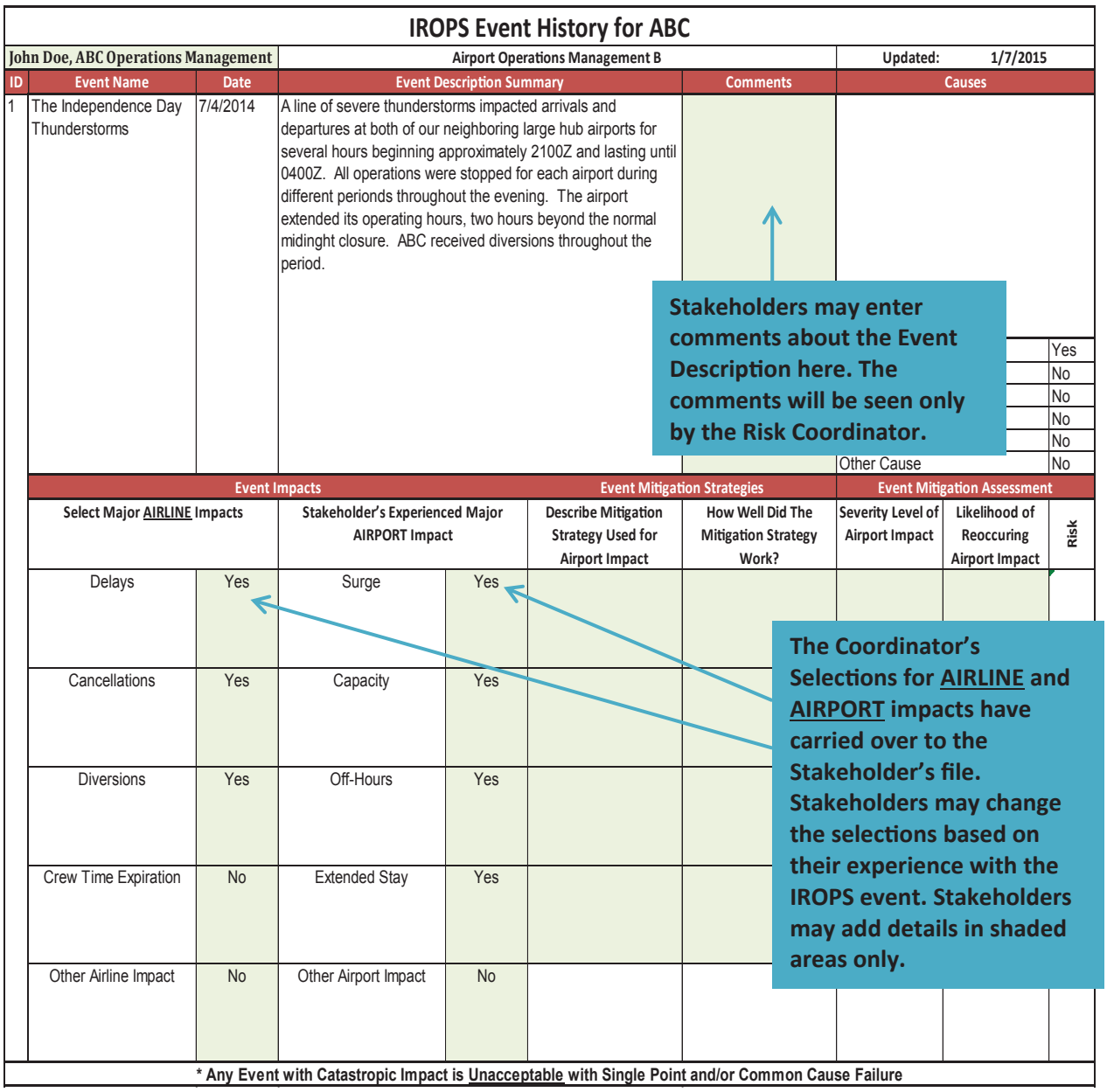


Figure 14. Expanded IROPS Event History worksheet.

Step 3 – Complete the **Event Mitigation Strategies** portion of the worksheet by entering the mitigation strategies that were used during the IROPS event described in the **Event Description Summary** and providing an assessment of how successfully the mitigation strategy worked.

IROPS Event History for ABC

John Doe, ABC Operations Management		Airport Operations Management B			Updated: 1/7/2015		
ID	Event Name	Date	Event Description Summary	Comments	Causes		
1	The Independence Day Thunderstorms	7/4/2014	A line of severe thunderstorms impacted arrivals and departures at both of our neighboring large hub airports for several hours beginning approximately 2100Z and lasting until 0400Z. All operations were stopped for each airport during different perionds throughout the evening. The airport extended its operating hours, two hours beyond the normal midinght closure. ABC received diversions throughout the period.		Extreme Weather	Yes	
					Natural Disasters	No	
					Airport Facilities	No	
					Mechanical Problems	No	
					Labor Issues	No	
					Other Cause	No	

Event Impacts				Event Mitigation Strategies		Event Mitigation Assessment		
Select Major AIRLINE Impacts		Stakeholder's Experienced Major AIRPORT Impact		Describe Mitigation Strategy Used for Airport Impact	How Well Did The Mitigation Strategy Work?	Severity Level of Airport Impact	Likelihood of Reoccuring Airport Impact	Risk
Delays	Yes	Surge	Yes	Used shared space agreements in Concourses, accommodated passengers on buses	The strategy was successful			
Cancellations	Yes	Capacity	Yes	Used shared agreements between carriers and CBP agreements were exercised	CBP agreements did not work well due to staffing shortage			
Diversions	Yes	Off-Hours	Yes	Coordinated with ATC to extend hours to accommodate late departures and arrivals	ATC was able to reschedule personnel to accommodate the extended hours			
Crew Time Expiration	No	Extended Stay	Yes	Used airline agreements with local hotels and for those who stayed at the airport	Strategy worked as expected however we ran out of mats			
Other Airline Impact	No	Other Airport Impact	No					

The best Mitigation Strategies begin with collaboration. Do Stakeholders have agreements in place with various service providers?

Figure 15. Complete the Event Mitigation Strategies portion of the worksheet.

Step 4 – Assign a **Severity** level and a **Likelihood** level to the airport impact from Event 1. To determine the most accurate Severity and Likelihood levels, Stakeholders can refer to **Sections 4.1** and **4.2** of this User's Guide. **Figure 16** continues the example using the Stakeholder from Airport Operations Management.

IROPS Event History for ABC

John Doe, ABC Operations Management			Airport Operations Management B		Updated: 1/7/2015	
ID	Event Name	Date	Event Description Summary	Comments	Causes	
1	The Independence Day Thunderstorms	7/4/2014	A line of severe thunderstorms impacted arrivals and departures at both of our neighboring large hub airports for several hours beginning approximately 2100Z and lasting until 0400Z. All operations were stopped for each airport during different perionds throughout the evening. The airport extended its operating hours, two hours beyond the normal midinght closure. ABC received diversions throughout the period.		Extreme Weather	Yes
					Natural Disasters	No
					Airport Facilities	No
					Mechanical Problems	No
					Labor Issues	No
					Other Cause	No

Event Impacts				Event Mitigation Strategies		Event Mitigation Assessment		
Select Major AIRLINE Impacts		Stakeholder's Experienced Major AIRPORT Impact		Describe Mitigation Strategy Used for Airport Impact	How Well Did The Mitigation Strategy Work?	Severity Level of Airport Impact	Likelihood of Reoccuring Airport Impact	Risk
Delays	Yes	Surge	Yes	Used shared space agreements in Concourses, accommodated passengers on buses	The strategy was successful	3. Moderate	B. Probable	
Cancellations	Yes	Capacity	Yes	Used shared agreements between carriers and CBP agreements were exercised	CBP agreements did not work well due to staffing shortage	2. Significant	C. Remote	
Diversions	Yes	Off-Hours	Yes	Coordinated with ATC to extend hours to accommodate late departures and arrivals	ATC was able to reschedule personnel to accommodate the extended hours	3. Moderate	C. Remote	
Crew Time Expiration	No	Extended Stay	Yes	Used airline agreements with local hotels and for those who stayed at the airport	Strategy worked as expected however we ran out of mats	3. Moderate	C. Remote	
Other Airline Impact	No	Other Airport Impact	No					

Figure 16. Assign a Severity level and a Likelihood level to the airport impact from Event 1.

Sometimes even the best plans are not enough. Sometimes it comes down to the availability of resources to mitigate a risk. Completing the information on mitigation strategies and the Event Mitigation Assessment helps ensure a common understanding of what resources are available to Stakeholders and highlights any needs and justifications for additional resources.

Step 5 – Repeat Steps 3 and 4 for Event 2.

Step 6 – Open the second worksheet in the **Airport Operations Management** file, entitled **IROPS Report Risk Assessment.** The Tool displays the highest risk recorded by the Stakeholder in each category across all Events. Notice that in **Figure 16,** "Extended Stay" was shown as a Yellow risk for Event 1. However, "Extended Stay" was rated as a Red risk in Event 2 (Freak Snow Storm—not shown). Therefore, because the **IROPS Report Risk Assessment** depicts the highest risk recorded per cause in all events, "Extended Stay" appears as a Red risk in **Figure 17**.

IROPS Risk Assessment and Mitigation for ABC

Airport Operations Management

		IROPS Response Plan Input	Expected Post-Mitigation			After IROPS Event				
Airport Impact	Risk	Revised Stakeholder Mitigation Plan	Severity Level of Airport Impact	Likelihood of Reoccuring Airport Impact	Risk	Mitigation Achieved?	Additional Local Mitigation	Severity Level of Airport Impact	Likelihood of Reoccuring Airport Impact	Post Mitigation Value
Surge										
Capacity										
Off-Hours										
Extended Stay										
Other Airport Impact										

Figure 17. Sample color-coded risks in the IROPS Report Risk Assessment.

Step 7 – Each Stakeholder can attempt to lower the risk assessments shown in the **IROPS Report Risk Assessment** by adding and adjusting input in the worksheet under the "IROPS Response Plan Input" and "Expected Post-Mitigation" columns (see **Figure 18**). This first attempt at lowering risk levels should be taken by each Stakeholder alone.

Airport Operations Management										
		IROPS Response Plan Input	Expected Post-Mitigation			After IROPS Event				
Airport Impact	Risk	Revised Stakeholder Mitigation Plan	Severity Level of Airport Impact	Likelihood of Reoccuring Airport Impact	Risk	Mitigation Achieved?	Additional Local Mitigation	Severity Level of Airport Impact	Likelihood of Reoccuring Airport Impact	Post Mitigation Value
Surge		Review shared space agreements to include unfinished room off of the concourse; pending funding	4. Minor	C. Remote						
Capacity		CBP agreement in place worked well; some impact caused by CBP staffing problems brought on by a confluence of events (sickness; auto accident; holiday)	3. Moderate	C. Remote						
Off-Hours		A study of the amount of times issue surfaced over the last 5 years does not warrant making changes to staffing profiles and schedules	3. Moderate	C. Remote						
Extended Stay		Purchase 100 mats; pending funding	3. Moderate	C. Remote						
Other Airport Impact		Strengthed communications with service providers; can mitigate by communicating sooner.	4. Minor	C. Remote						

Figure 18. Lower the risk assessment by revising the mitigation plans.

Save the work. **Do not change the file name.**

Each Stakeholder should complete Steps 1 through 7 for their organization.

Step 8 – Transmit the completed file back to the Risk Coordinator. **Do not change the file name.**

Section 9 Reports

9.1 IROPS Report Risk Assessment

After all Stakeholders have made their entries into their **IROPS Risk Assessment and Mitigation** worksheets and transmitted them back to the Risk Coordinator, the Risk Coordinator saves them in The Tool folder, replacing the old files with the new. Then, upon opening his or her file, the Risk Coordinator's worksheet (**IROPS Report Risk Assessment**) will be updated to reflect the Stakeholders' cumulative assessment of the risks under the current mitigation plans and their assessment of the risks after altering their mitigation plans (**Figure 19**).

ABC	CURRENT RISKS Airport Impacts					POST-MITIGATION RISKS Airport Impacts				
Stakeholder Group	Surge	Capacity	Off-Hours	Extended Stay	Other Airport Impact	Surge	Capacity	Off-Hours	Extended Stay	Other Airport Impact
Airport Executive Management										
Airport Operations Management										
Airport Airside Management										
Airport Landside Management										
Airport Terminal Management										
Airport Emergency Operations / Communications										
Airport Passenger Services										
Airport Maintenance										
Airport Police										
Aircraft Rescue & Firefighting (ARFF)										
Airport Pet Relief Area Contact										
Airport Concessions										
Airport Public Relations										
Airport Technology										
Fixed Base Operators (FBO)										
Aircraft Refueling Company (other than FBO)										
Aircraft De-Icing Company (other than FBO / Airline)										
Airport Operations (regional airports)										
Airline 1 Station Manager (local airport)										
Airline 1 Station Manager (regional airports)										
Airline 1 Operations Centers SOC/AOC										
Airline 1 Chief Pilot's Office										
Airline 2 Station Manager (local airport)										
Airline 2 Operations Centers SOC/AOC										
Airline 2 Chief Pilot's Office										

Figure 19. Risk Coordinator's IROPS Report Risk Assessment worksheet showing all Stakeholders' input.

9.2 Current Risks

The **Current Risks** shown in **Figure 19** represent an assessment of the airport's IROPS event risks (airport impacts) based on the cumulative inputs of the Stakeholders for a given IROPS event (in this example, "The Independence Day Thunderstorms") and current mitigation plans.

9.3 Post-Mitigation Risks

The **Post-Mitigation Risks** shown in the right hand columns of **Figure 19** represent a compilation of each Stakeholder's individual post-mitigation efforts. It represents how each Stakeholder has assessed risk after revising their mitigation plans. This part of the worksheet becomes the Risk Coordinator's starting point for follow-up communications with all Stakeholders. This information can be used to assess where problems still exist and demonstrate where further actions need to be taken.

Section 10 Follow-up Actions: Meet/Reassess/Update

The primary benefit of using the IROPS Risk Assessment Tool (The Tool) is the communication and collaboration required of users to follow the process of using The Tool. Up to this point the Risk Coordinator and Stakeholders have been conducting a self-evaluation of their performance during IROPS events and attempting to enhance their mitigation plans by working individually to populate selections in The Tool. The next step is for Stakeholders to come together and discuss their self-evaluations, reassessing and updating mitigation plans for the next time an IROPS event occurs.

10.1 Risk Coordinator's Actions

The Risk Coordinator, acting as facilitator and record keeper, hosts an IROPS Risk Assessment Meeting with the Stakeholder groups, with the goal of accomplishing the following tasks:

1. Discuss each risk and examine ways to lower them.
2. Develop or strengthen agreements regarding shared resources.
3. Develop or strengthen agreements that enhance communications before, during, and after IROPS events.
4. Ensure all Stakeholders' contact information is current and complete.
5. Develop a list of resources and equipment that require funding and that can help lower risks for the airport in meeting safety and regulatory requirements.
6. Make note of any changes to plans or risk assessment.
7. Plan how you will use the **After IROPS Event** assessment discussed in **Section 10.3** of this User's Guide.

10.2 Stakeholders' Actions

Whenever Stakeholders discover that changes need to be made to current plans and risk assessment as a result of the IROPS Risk Assessment Meeting, they should update their individual **IROPS Report Risk Assessment** worksheets. Stakeholders should then make the appropriate amendments to the "IROPS Response Plan Input" and "Post-Mitigation" sections of their files and re-transmit them to the Risk Coordinator via email. (Remember: Do not change the file name. See Appendix D to this Users Guide for tips on file manaagement.) These updated files will be linked to a new report that the Risk Coordinator will maintain. This revised report can be used to ensure that the recommended changes or new procedures are developed, disseminated (through training), and ultimately implemented during a future IROPS event.

10.3 After IROPS Event

The "After IROPS Event" portion of the Stakeholder's **IROPS Report Risk Assessment** is used to capture how successfully a mitigation plan worked during the next IROPS event. It is the Stakeholder's personal "report card" and represents a continuous improvement process. If mitigation was achieved to a Stakeholder's satisfaction, it is a good idea to let others know about a new best practice. If, however, a Stakeholder recognizes that additional mitigation actions were necessary and possible, the Stakeholder can take action to coordinate his or her revised plan with the appropriate parties and record it in the "Additional Local Mitigation" column. It is important to reassess the severity and likelihood levels and determine a "Post-Mitigation Value."

How each Stakeholder uses the "After IROPS Event" section should be discussed with the Risk Coordinator and with other Stakeholders. The post-analysis of an IROPS event can drive decisions regarding the need for additional IROPS mitigation planning sessions, the need for training and tabletop exercises, or the need for documenting best practices.

These mitigation assessments should be taken as a key part of each stakeholder organization's After-Action review of their performance effectiveness, which is described as part of the IROPS Planning recommendations for capturing lessons learned and updating plans in *ACRP Report 65.*

IROPS Risk Assessment and Mitigation for ABC

Airport Operations Management

		IROPS Response Plan Input	Expected Post-Mitigation			After IROPS Event				
Airport Impact	Risk	Revised Stakeholder Mitigation Plan	Severity Level of Airport Impact	Likelihood of Reoccuring Airport Impact	Risk	Mitigation Achieved?	Additional Local Mitigation	Severity Level of Airport Impact	Likelihood of Reoccuring Airport Impact	Post Mitigation Value
Surge		Review shared space agreements to include unfinished room off of the concourse; pending funding	4. Minor	C. Remote						
Capacity		CBP agreement in place worked well; some impact caused by CBP staffing problems brought on by a confluence of events (sickness; auto accident; holiday)	3. Moderate	C. Remote		No	More advanced notification of international diversions continues to be an issue. Made contact with overlying ARTCC Traffic Management Officer and US code sharing partners of the involved international carriers for help.	4. Minor	C. Remote	
Off-Hours		A study of the amount of times issue surfaced over the last 5 years does not warrant making changes to staffing profiles and schedules	3. Moderate	C. Remote						
Extended Stay		Purchase 100 mats; pending funding	3. Moderate	C. Remote						
Other Airport Impact		Strengthed communications with service providers; can mitigate by communicating sooner.	4. Minor	C. Remote						

Figure 20. After IROPS Event portion of Stakeholder's IROPS Report Risk Assessment

10.4 Using The Tool for Training

Following the process for using The Tool can be useful during two of the phases of an IROPS event: the *Planning* phase and the *After* phase. The Tool can identify weaknesses in an airport's IROPS mitigation strategies. It can highlight what internal and external agreements need to be developed or strengthened, identify resource requirements, and identify training needs in executing IROPS mitigation plans. Using The Tool also can provides a valuable platform for conducting local tabletop exercises in IROPs event planning.

APPENDIX A

Data Sources

A.1 Federal Data Sources

A multitude of available data sources are useful for IROPS planning and impact mitigation. **Table 1** summarizes major federal data resources and identifies their public availability:

Table 1. On-line federal data resources.

Resource Name	URL	Publicly Available?
ASPM	http://aspm.faa.gov	Partially*
OPSNET	https://aspm.faa.gov/opsnet/sys/main.asp	Yes
TFMS		No
TFMSC	https://aspm.faa.gov/tfms/sys/main.asp (Requires registered user name and password)	Yes
ASQP	https://aspm.faa.gov/asqp/ (Requires registered user name and password)	Yes
ATCSCC web portal	http://www.fly.faa.gov	Yes
NTML		No
Diversion Recovery Tool		No
Diverted Flight List		No
Aviation Data and Statistics	http://www.faa.gov/data_research/aviation_data_statistics/	Yes
BTS	http://apps.bts.gov/	Yes

*Note: Upon request, airport authorities may obtain ASPM higher level data access.

A.1.1 Air Traffic Control System Command Center's Web Portal

Table 2 presents flight data sources available from the Air Traffic Control System Command Center (ATCSCC)'s Web Portal (http://www.fly.faa.gov):

Table 2. ATCSCC web portal data resources.

Resource	URL	Notes
Advisories Database	http://www.fly.faa.gov/adv/advADB.jsp	
Diversion Forums	http://www.fly.faa.gov/Diversion/diversion.jsp	

Resource	URL	Notes
Aviation Information System (AIS)	https://www.fly.faa.gov/ais/jsp/ais.jsp	The operating status of the nation's largest airports and delay information from the FAA can be sent to wireless device, pager, phone, or email in real-time, as changes happen
Current reroutes	http://www.fly.faa.gov/ratreader/jsp/index.jsp	
Current restrictions	http://www.fly.faa.gov/current_restrictions/jsp/index.jsp	
Operation Information System (OIS)	http://www.fly.faa.gov/ois/	
Flight Delay Information	http://www.fly.faa.gov/flyfaa/usmap.jsp	

A.1.2 Aviation Weather Center Web Portal

Table 3 presents resources available through the National Oceanic and Atmospheric Administration (NOAA)'s Aviation Weather Center web portal at http://aviationweather.gov. These data sources provide weather observation and forecast data for a variety of weather phenomena, including convection, turbulence, icing, winds, ceiling and visibility, and others.

Table 3. NOAA's web portal data resources.

Resource	URL	Notes
Forecast and past weather information	http://www.weather.gov	National Weather Service
Weather outlook; historical hurricane tracks and climate at a glance	http://climate.gov	
NWS GIS Data Portal	http://www.nws.noaa.gov/gis	Geographic Information System (GIS)
National Climatic Data Center provides Daily and monthly summary observations; climate indices; historical global ship tracks; NEXRAD radar data.	http://gis.ncdc.noaa.gov/	
Public access to the Nation's climate and historical weather data and information	http://www.ncdc.noaa.gov	NOAA's National Climatic Data Center (NCDC)

A.1.3 Bureau of Transportation Statistics (BTS)

BTS provides airline on-time statistics data through its web portal at http://apps.bts.gov. The data include summary statistics reporting all flights, late flights (total number, average departure delay, average taxi-out and average scheduled departure), and diverted or canceled flights (total and percent of diverted and canceled flights). BTS datasets also provide detailed statistics on on-time departure and arrival performance (scheduled departure time, actual departure time, scheduled elapsed time, departure delay, wheels-off time and taxi-out time) by airport and airline as well as airborne time, cancellation, and diversion count by airport and airline.

A.2 Non-federal Flight Data Resources

The resources listed in **Table 4** provide information related to air travel in the United States. The resources are identified in alphabetical order with brief explanations of available data provided, and URLs are indicated, unless restricted.

This is not a complete list, but the information is valid as of the writing of this guidebook. Additionally, some of the resources listed are company products that must be purchased (e.g., Aerobahn by SAAB Sensis). Other resources are available in a limited form for free, such as PASSUR, but require contractual arrangements to access all of their data. Whether or not these are available to the general public, they are available and currently in use to one degree or another by operators, airport management and Air Navigation Service Providers.

Table 4. Non-federal flight data resources.

Resource	What	URL
Airline information	Flight information, schedule disruptions	airline websites, ex: http://www.delta.com/
Airport Management	Irregular operations advisories	websites ex: http://www.metroairports.org/Airport-Authority.aspx
ARINC - Aeronautical Radio Incorporated *	Communications, Engineering, Systems Integration	http://www.arinc.com/capabilities/
EUROCONTROL NOP	System status, delays, etc.	https://www.public.cfmu.eurocontrol.int/PUBPORTAL/gateway/spec/index.html
Flight Aware	Flight tracking	http://flightaware.com/
Flight Radar 24	Flight tracking	http://www.flightradar24.com/
Flight Stats	Flight status, airport info, weather, mobile apps, etc.	http://www.flightstats.com/go/Home/home.do
Flight View	Flight status, airport info, weather, mobile apps, etc.	http://www.flightview.com/

Resource	What	URL
Harmony for Air Navigation Service Providers (Metron) *	Integrated Air Traffic Flow Management (I-ATFM) solution	http://www.metronaviation.com/products/metron-harmony/metron-harmony-for-ansps.html
Harmony for Airlines (Metron) *	Integrated Air Traffic Flow Management (I -ATFM) solution	http://www.metronaviation.com/products/metron-harmony.html
Media, airline source	airline status reports, disruption alerts, etc.	Airline websites
News media, electronic	Web, mobile, any public place where people gather…	http://www.cnn.com/ http://www.msn.com/ local TV stations
News media, print	Newspapers (*USA Today, NY Times,* etc.)	google by name
PASSUR *	Tracking data	http://www.passur.com/
Report 65	Irregular operations	http://www.trb.org/Publications/Blurbs/166569.aspx
Sensis (Aerobahn) *	Tracking data	http://www.saabsensis.com/products/aerobahn/
Skift *	reports on trends	http://skift.com/travel-trends/the-rise-of-the-silent-traveler-reaching-out-to-the-mobile-first-travel-consumer/
Symphony (Exelis) *	Tracking data	http://www.exelisinc.com/solutions/Symphony/Pages/default.aspx
Egencia	Travel APP	http://www.egencia.com/en/
FlightCaster Pro	FlightCaster can predict your probability of delay, hours before the airline or any other app notifies you.	http://download.cnet.com/FlightCaster-Pro/3000-20428_4-75344350.html
iFly Pro	Airport guide APP	http://www.ifly.com/iFlyProApp.html
WhatsBusy	Security Delay Information	http://www.whatsbusy.com/airport/

* Data is not free.

APPENDIX B

Types of IROPS Events and Impacts

B.1 Events

Table 1. Event and event subtypes.

Event/Event Subtype	Event/Event Subtype
Severe Weather Events • High wind • Tornado • Hurricane/tropical cyclone • Heat wave • Extreme cold • Dense fog • Thunderstorm/heavy rain/flooding • Electrical storm • Snow/blizzard • Damaging hail • Ice storm • Dust storm **Natural Disasters** • Earthquake • Volcanic eruption • Landslide • Dam break • Tsunami • Wildfire • Solar storm **Man-made Disasters** • Hazardous materials release • Military aircraft/ordnance issue • Discovery of explosives **Aircraft and Vehicle Accidents/Emergencies** • Aircraft accident • Structural fire • Access road accident • Railway/people mover accident/ mechanical problem **Medical Emergency** • Aircraft medical emergency • Terminal medical emergency	**Infectious Diseases** • Individual carrier • Epidemic • Pandemic **Security** • Checkpoint security breach • Navigation system jamming/spoof • Hijacked aircraft • Laser attack • Perimeter security breach • Terrorist attack • Unattended/suspicious luggage **Construction/Mechanical** • Air conditioning failure • Damaged cable • Damaged pipeline • Heat failure • Power failure • Water line break **Airline Operations** • Flight reservation system/IT outage **Labor Disruption** • Air traffic control labor disruption • Airline labor disruption • Airport labor disruption • Security/Federal Inspection Services labor disruption **Very Important Person (VIP)** • VIP/sports team arrival/departure

Source: J. Karlsson, et al. (2014), ACRP Report 106: Being Prepared for IROPS: A Business-Planning and Decision-Making Approach, Transportation Research Board of the National Academies, Washington, D.C., Table 2, p. 12.

B.2 Impacts

Table 2. Impact types.

Impacts
Aircraft recalled to gate
Disrupted communications
Diverted flights to airport
Excessive queue lengths (check-in)
Excessive queue lengths (security)
Extended passenger delay (generated off-airport)
Extended passenger delay (terminal)
Extended tarmac delay
Power outage and/or utility disruptions
Quarantined aircraft/passengers
Unanticipated need for Federal Inspection Services
Unexpected closure of control tower/approach control facility
Unexpected closure of runway
Unexpected closure of terminal/concourse
Unexpected passenger surge (terminal)

Source: J. Karlsson et al. *(2014), ACRP Report 106: Being Prepared for IROPS: A Business-Planning and Decision-Making Approach,* Transportation Research Board of the National Academies, Washington, D.C., Table 3, p. 13.

APPENDIX C

IROPS Risk Assessment Tool Quick Reference Guide

IROPS Risk Assessment Tool Quick Reference Guide*

Risk Coordinator:

1. Open the **IROPS Risk Assessment Tool** (The Tool) and enable macros. Copy the files to a local folder. (Please see **Appendix D – Minimum System Requirements and File Management** before proceeding.)
2. Open the **Coordinator** file.
3. Open the **Airport Profile** worksheet and complete the airport profile.
4. Open the **Stakeholder Selection** worksheet and make the stakeholder selections.
5. Open the **Stakeholder Representatives** worksheet and enter the names and email addresses of the selected Stakeholders.
6. Open the **IROPS Event History Summary** worksheet and enter a description of an IROPS event; select the cause of the event and select the impacts from the event.
7. Save and close the **Coordinator** file. Open each of the selected Stakeholders' files, one at the time. Select "Enable Content," update, and save the file. Doing this will ensure that all data is carried over from the Coordinator's file to the Stakeholders' files.
8. Send individual emails to each Stakeholder selected in the **Stakeholder Selection** worksheet, attaching the appropriate Stakeholder's file. Include in the email the indicators for Severity and Likelihood developed for the airport.
9. See the IROPS Risk Assessment Tool User's Guide, **Section 7**, for more detail.

Stakeholder:

1. Open the file received from the Risk Coordinator.
2. Open the **IROPS Event History** worksheet. The worksheet will be populated with the event descriptions written by the Risk Coordinator and the airline and airport impact selections selected by the Risk Coordinator.
3. Make entries in the shaded cells. If you wish to change the airline/airport impacts selected by the Risk Coordinator, clicking inside the cell will bring up a drop-down menu with "Yes" or "No" options. Select all that apply.
4. Complete the "Event Mitigation Strategies" portion of the worksheet. Enter the mitigation strategies that were used during the event described in the "Event Description Summary" portion of the worksheet and your assessment of how successful the mitigation strategies worked.
5. Complete the "Event Mitigation Assessment" portion of the worksheet by assigning a Severity level and a Likelihood level to the airport impact utilizing the drop-down menu within the cell. Repeat for each event.
6. Open the **IROPS Report Risk Assessment** worksheet. The highest risk recorded by the Stakeholder in each category across all events will be shown.
7. Enter revisions to the mitigation plans, then reassess the risk. This first attempt to revise mitigation plans should be taken by the Stakeholder alone.
8. Transmit the completed file back to the Risk Coordinator.
9. See the IROPS Risk Assessment Tool User's Guide, **Section 8**, for more detail.

* For best results, read the complete IROPS Risk Assessment Tool User's Guide prior to using The Tool.

APPENDIX D

Minimum System Requirements and File Management

D.1 Minimum System Requirements

The Tool will run on any laptop or personal computer with Microsoft Excel, version 2007 or later. **In order to operate this Tool, all macros and content from Microsoft Excel must be enabled.** If you do not enable macros, The Tool will not automatically exchange data entered in the worksheets contained in the various Microsoft Excel files. Excel 2013 users, please see **Appendix E – Special Instructions for Microsoft Excel 2013 Users.**

Enabling Macros Manually

On the initial opening of The Tool, users will be prompted to **Enable Content** or **Enable Macros,** depending on the user's version of Excel. Users can manually enable macros by performing the following steps:

1. In Excel go to **File** tab, and select **Options**.
2. In the left-hand side pane, click **Trust Center**.
3. On the right-hand side, click **Trust Center Settings**.
4. In the left-hand side pane, click **Macro Settings**
5. Select the **Enable All Macros** option.
6. Select **OK**.

D.2 File Management

To start, the Risk Coordinator will need to copy the files containing the IROPS Risk Assessment Tool (The Tool) to the hard drive and extract all files from this ZIP file to a local folder. To ensure proper functioning of The Tool, **all extracted files need to reside in the same folder.** This is necessary to enable automated updating of content information across the Risk Coordinator and Stakeholders' files. Another important requirement is that **the names of all files in this folder must remain unchanged**. This is particularly important when the Risk Coordinator exchanges the files with Stakeholders to obtain their feedback and copies the files back into the folder. When a completed (revised) Stakeholder file is about to be placed back in the folder where all IROPS Risk Assessment Tool files are stored, the Risk Coordinator needs to ensure the following:

The Risk Coordinator should:

1. **Copy the ZIP file into a local folder.**
2. **Create a Master file and a working copy.**

NEVER change the file names!!

1. The name of the revised file obtained from the Stakeholder is the same as the name of the file the Risk Coordinator sent to the Stakeholder (i.e., the Stakeholder did not modify the file name).
2. The revised file replaces the previous version of the file located in the folder (i.e., the Risk Coordinator overwrites the old version of the file with the revised version).

Given these requirements, it is suggested that the Risk Coordinator maintain *not only* the current set of files located in the local folder, but also an archive of the older file versions. To accomplish this, it is suggested that the Risk Coordinator create subdirectories within the local folder to hold versions of all

files at specific points in time. One strategy for maintaining an archive is to name the archive folders using dates that denote when the files were added to the archive. For example, a subfolder might be created with the name "20150326 Initial IROPS SCC", indicating that the archive folder for IROPS Stakeholder Communication and Coordination was created on March 26, 2015. At each stage, the Risk Coordinator saves an archival copy of all IROPS Risk Assessment Tool files to the desired archive subfolder (see **Figure 1**).

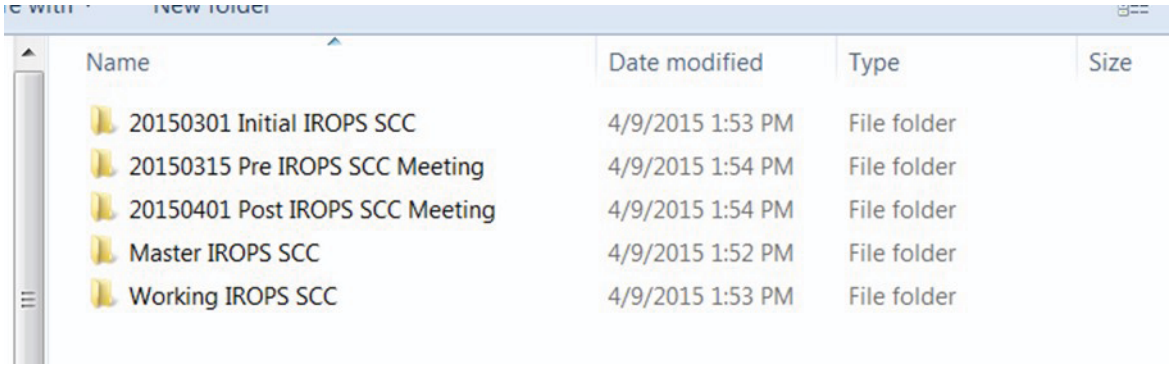
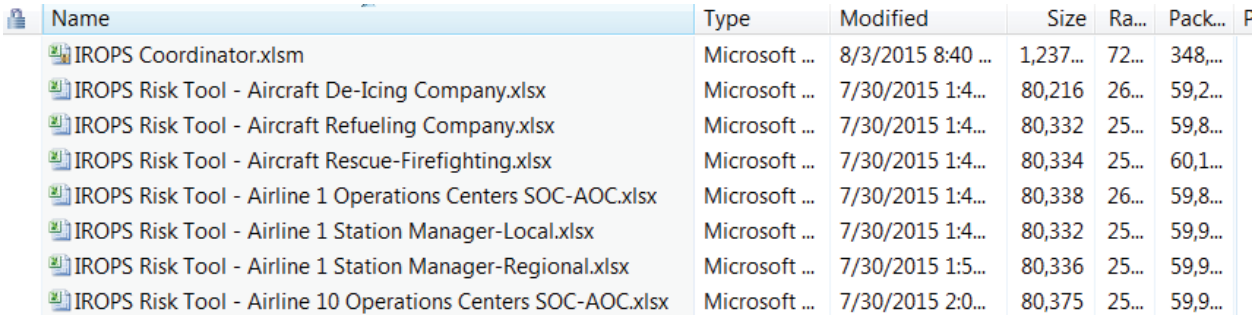


Figure 1. File management sample.

It is also recommended that each Stakeholder maintain a similar archive for his or her versions of the files. A suggested method is to archive the **IROPS Stakeholder Communication and Coordination** worksheet and save the document after each IROPS Risk Coordinator action. In the event of an inadvertent error, the Risk Coordinator will be able to easily rebuild the document back to a working state.

Sample File Management/Archive Protocol for IROPS Coordinator

1. Upon initial download, archive/save the IROPS Risk Assessment Tool documents to a folder with a label such as "**Master IROPS SCC**".
2. Create a copy of the entire set of files, saving the documents to a new folder labeled "**Working IROPS SCC**". **Once created, this folder will always be the one used for data entries, file replacement, etc.**
3. *After* completing IROPS event entries but *before* sending individual files to Stakeholders, archive/save a copy of the **IROPS Risk Tool – Coordinator.xlsm** file to a folder labeled "[Date]Initial IROPS SCC".
   When The Tool next opens in Excel, individual files named for the Coordinator and the selected Stakeholders will already have been created (see Figure 2).
4. Upon receiving the completed/returned Stakeholder files, save each file by overwriting the file **with the identical file name** in the "Working IROPS SCC" folder. Prior to the IROPs SCC meeting, archive/save a copy of the updated **IROPS Risk Tool – Coordinator.xlsm** file to a new folder with a label such as "[Date] Pre IROPS SCC meeting".
5. After the IROPS SCC meeting, document decisions made (e.g., changes to mitigation plans and actions) and archive/save a copy of the final **IROPS Risk Tool – Coordinator.xlsm** file to a folder with a label such as "[Date] Post IROPS SCC meeting".
6. Date each ARCHIVAL folder; DO NOT DATE the files or the Master and Working folders.



Name	Type	Modified	Size	Ra...	Pack...
IROPS Coordinator.xlsm	Microsoft ...	8/3/2015 8:40 ...	1,237...	72...	348,...
IROPS Risk Tool - Aircraft De-Icing Company.xlsx	Microsoft ...	7/30/2015 1:4...	80,216	26...	59,2...
IROPS Risk Tool - Aircraft Refueling Company.xlsx	Microsoft ...	7/30/2015 1:4...	80,332	25...	59,8...
IROPS Risk Tool - Aircraft Rescue-Firefighting.xlsx	Microsoft ...	7/30/2015 1:4...	80,334	25...	60,1...
IROPS Risk Tool - Airline 1 Operations Centers SOC-AOC.xlsx	Microsoft ...	7/30/2015 1:4...	80,338	26...	59,8...
IROPS Risk Tool - Airline 1 Station Manager-Local.xlsx	Microsoft ...	7/30/2015 1:4...	80,332	25...	59,9...
IROPS Risk Tool - Airline 1 Station Manager-Regional.xlsx	Microsoft ...	7/30/2015 1:5...	80,336	25...	59,9...
IROPS Risk Tool - Airline 10 Operations Centers SOC-AOC.xlsx	Microsoft ...	7/30/2015 2:0...	80,375	25...	59,9...

Figure 2. Excel files for the Stakeholders and Risk Coordinator are automatically created.

The Risk Coordinator Must Ensure the Following:

- **All extracted files reside in the same folder in order to enable automated updating of content information across the Risk Coordinator's and Stakeholders' files.**
- **The names of all files in the folder remain unchanged.**
  - **Before placing a revised Stakeholder file back in the folder, ensure that the Stakeholder did not modify the file name.**
  - **The revised file overwrites the old version of the file.**

APPENDIX E

Special Instructions for Microsoft Excel 2013 Users

This appendix provides step-by-step guidance on how to use the IROPS Risk Assessment Tool (The Tool) in MS Excel 2013. This version of Excel has an enhanced security feature that by default disables active content included in The Tool in order to automatically synchronize content between the Coordinator and Stakeholder files. The simple procedure described below will enable active content in all files so that content synchronization is fully supported.

1. As described earlier in the Users Guide, copy all the files to a local directory and unzip the content if necessary (in case The Tool was provided as a zipped file).
2. Double-click on IROPS Coordinator.xls to open the Coordinator file.
3. The Risk Coordinator file will open with a SECURITY WARNING message as shown in **Figure 1.** This security warning is caused by the active content that is included in the file for content synchronization.

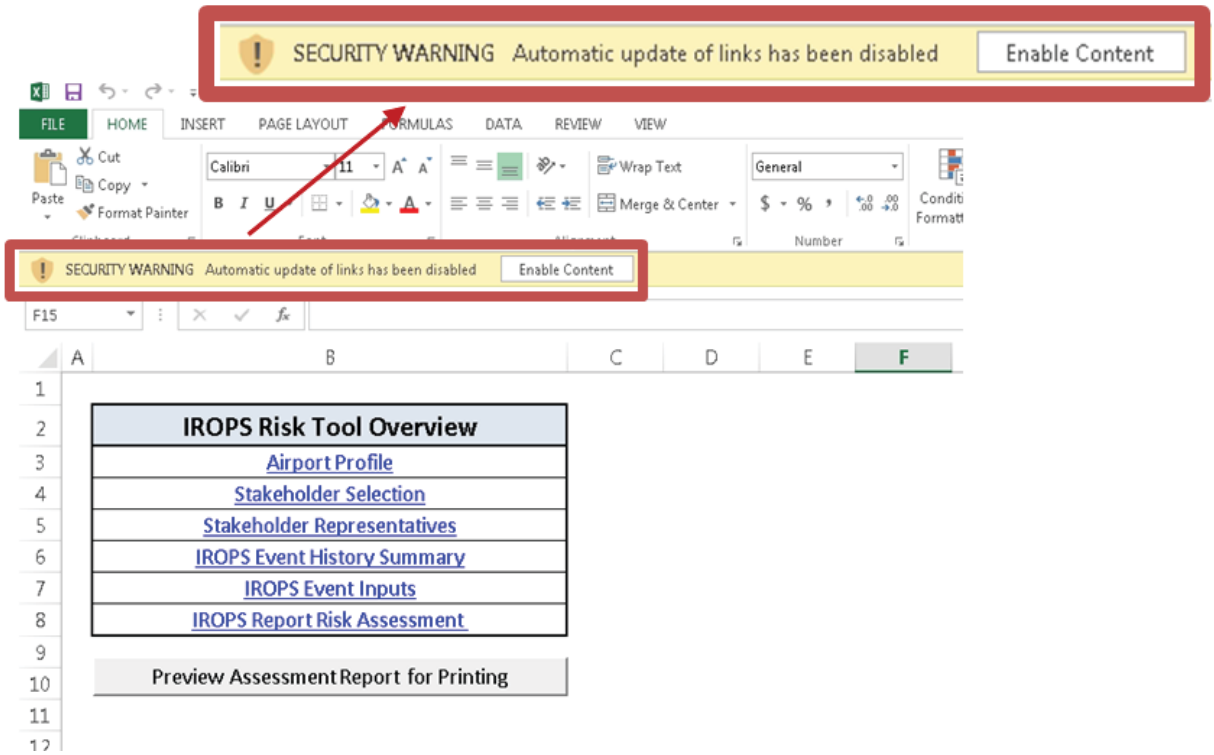


Figure 1. Security Warning shown to Excel 2013 users.

4. In order to enable Active content and disable the Security Warning, click on the File tab as shown in **Figure 2**.

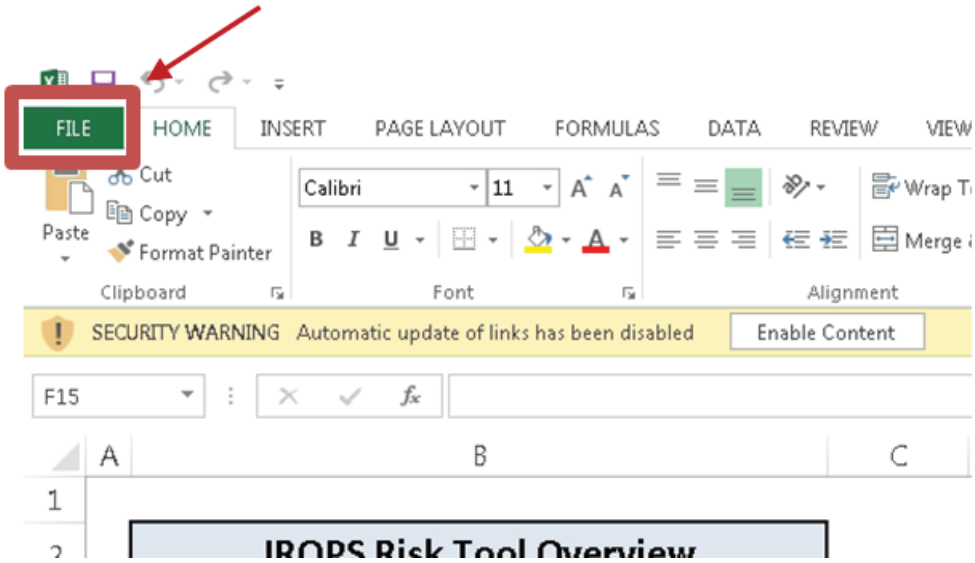


Figure 2. File tab location.

5. The Info section will open as shown in **Figure 3.** In the Security Warning section, click on the Enable Content dropdown menu and select Enable All Content.

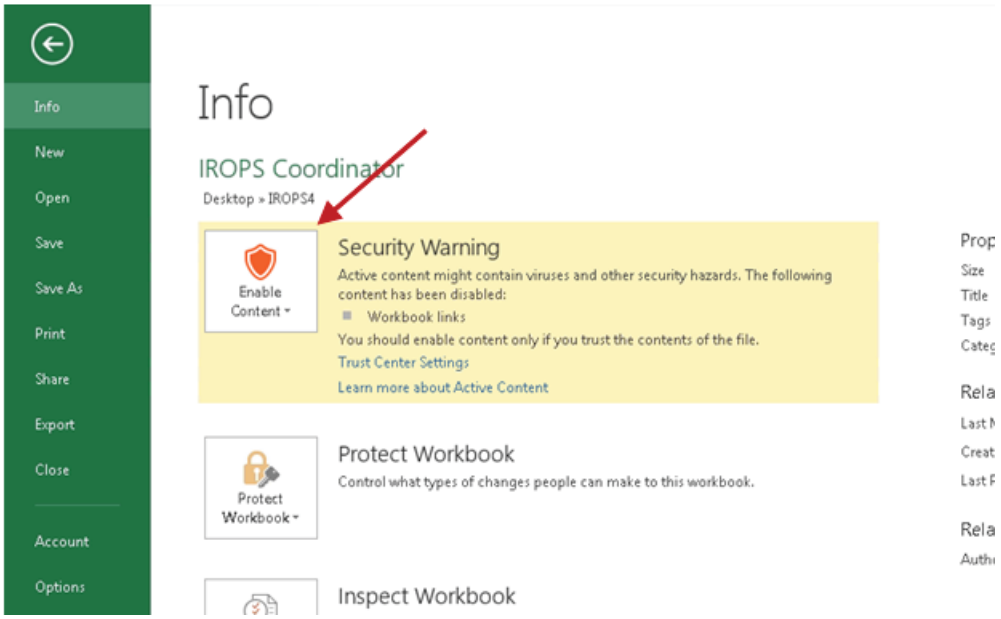


Figure 3. Enable Content dropdown menu on File > Info tab.

Abbreviations and acronyms used without definitions in TRB publications:

A4A	Airlines for America
AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation Act (2015)
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
MAP-21	Moving Ahead for Progress in the 21st Century Act (2012)
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TDC	Transit Development Corporation
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation

TRANSPORTATION RESEARCH BOARD
500 Fifth Street, NW
Washington, DC 20001

ADDRESS SERVICE REQUESTED

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

The nation turns to the National Academies of Sciences, Engineering, and Medicine for independent, objective advice on issues that affect people's lives worldwide.
www.national-academies.org

ISBN 978-0-309-37534-4
90000
9 780309 375344