



*Year 2000 Program*

**THE MASSPORT YEAR 2000 PROGRAM**

**PROGRAM SUMMARY**

This document is a  
**Year 2000 Readiness Disclosure**  
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and Readiness Disclosure Act

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# THE MASSPORT YEAR 2000 PROGRAM

## PROGRAM SUMMARY

### TABLE OF CONTENTS

INTRODUCTION	1
MASSPORT FACILITIES & ACTIVITIES	2
THE MASSPORT YEAR 2000 PROGRAM	4
The Year 2000 Problem and Massport	4
The Year 2000 Program Team	4
YEAR 2000 PROGRAM METHODOLOGY	5
Massport System Compliance	5
Phase I: System Inventory	5
Phase II: System Prioritization	6
Phase III: System Assessment	6
Phase IV: Compliance Recommendation	6
Phase V: Implementation & Testing	7
Phase VI: Independent Testing, Verification & Validation	7
Phase VII: Contingency Planning	8
Fault Tree Analysis	9
Third Party Issues	9
Massport Business Continuity Plans	10
Program Management Tools & Due Diligence	10
Program Schedule	10

# THE MASSPORT YEAR 2000 PROGRAM

## INTRODUCTION

### The Year 2000 Problem

Virtually everyone is now aware of the so-called "Year 2000 Problem": the potential inability of many electronic systems that have date sensitive software or computer chips to recognize the year 2000, and the likely consequences that may result. The Year 2000 Problem is sometimes referred to as "the Millennium Bug".

The Year 2000 Problem stems from computer-related elements (including embedded chips used in equipment and facilities) that have been designed to use only two digits to identify the year/date. These issues extend to programming in equipment and systems such as lighting, fire alarm, elevator, HVAC and other systems. Most experts agree that many automated systems may fail at or near January 1, 2000, unless proactive measures are taken to ensure that automated systems are "Year 2000 Compliant" -- i.e., that the systems will accurately process date/time data through the next century.

The Massachusetts Port Authority has been working on the Year 2000 Problem since 1996. This document briefly describes the scope of Massport's operations, the ways in which the Year 2000 Problem could affect those operations and related business activities, and the steps being taken by the Authority to provide business continuity through Year 2000. *This document is a Year 2000 Readiness Disclosure within the meaning of the Year 2000 Information and Readiness Disclosure Act.*

### The Massport Year 2000 Program

The Massport Year 2000 Program is an Authority-wide program to address Year 2000 issues and prepare Massport for the upcoming transition to calendar date 2000. Massport has established a Year 2000 Program Office (the Program Office) to manage and coordinate all Year 2000 Program activities, and has developed a Year 2000 Program and implementation strategy. The Program Office is located within the Information Services and Telecommunications (IS/T) Department, whose staff commenced Year 2000 Compliance activities in 1996. While the Program Office is located within the IS/T Department, the Year 2000 Program is designed to provide business and operational continuity: the success of the Year 2000 Program requires the awareness, cooperation and coordination of staff throughout the Authority. The Year 2000 Program has received the support of the Massport Board, Massport executive staff and senior management. The Program Office has and will continue to work closely with other Authority staff to carry out the Year 2000 Program.

The Program Office is leading a significant effort to achieve Year 2000 Compliance for the over 300 automated systems within Massport's purview. As a part of the overall strategy for maintaining business continuity through Year 2000, the Program Office is also developing contingency plans and designing back-up measures to maintain operational continuity in the unlikely event of breakdowns within the Authority's mission critical systems.

The Program Office is also evaluating the extent to which Massport's operating systems and facilities may be vulnerable to failures by its major suppliers, distributors, and service providers to become Year 2000 compliant, and intends to take appropriate actions to mitigate such vulnerabilities.

The Authority has established a budget of approximately \$5.4 million to achieve Year 2000 Compliance for those automated systems within the Authority's purview. This amount does not necessarily cover all costs potentially related to the Year 2000 problem, as Massport's ongoing purchases of systems and upgrades from its general budget funds will also achieve Year 2000 Compliance for systems which might otherwise require remediation. Massport is a dynamic organization which operates in a rapidly changing business environment; as the Year 2000 Team completes its Year 2000 Program activities, ongoing reviews and analyses, as well as operational, financial, technical and other changed circumstances may cause the number of systems under review, the priority assigned to those systems and/or the budget to change. Finally, additional funding may also be required to implement contingency plans.

Massport is committed to addressing the issues attributed to the upcoming calendar change in year 2000 and to establishing safeguards and procedures to address problems that could affect Massport's ongoing operations and business activities.

## **MASSPORT FACILITIES and ACTIVITIES**

The Massachusetts Port Authority controls, operates and manages:

- Boston-Logan International Airport,
- Hanscom Field,
- Maurice J. Tobin Memorial Bridge, and
- various Port Properties.

These facilities are described below.

### Boston- Logan International Airport

Logan International Airport is a large air traffic hub serving over 60 regional, national and international air carriers, and was recently ranked the 17<sup>th</sup> busiest passenger airport in the United States and the 26<sup>th</sup> busiest airport in the world. As owner and operator of Logan, Massport also serves as landlord to approximately 1,200 tenants and concessionaires. Logan Airport is currently in the midst of a \$1 billion modernization project to expand terminals, improve ground transportation and reduce air traffic delays.

### Hanscom Field

The Lawrence G. Hanscom Field is a 1,300-acre airfield located principally in the town of Bedford, Massachusetts. Hanscom Field is New England's busiest general aviation airport. As home to about 500 business and private aircraft, Hanscom Field serves the diverse flying needs of corporations, research and development firms, educational institutions, and individuals. A small portion of Hanscom Field is occupied by the United States Air Force.

### Tobin Memorial Bridge

The Maurice J. Tobin Bridge is the 15th busiest bridge in the United States, and plays a critical role in the local and regional transportation network. Tobin Bridge is a high-level, double-decked structure with three traffic lanes on each deck and seven toll collection booths on the southbound deck(s). The Tobin Bridge is nearly two miles long and serves approximately 36,000 motorists daily.

### Port of Boston Maritime Facilities

Massport owns, manages, develops and markets major public cargo and passenger terminals in the Port of Boston--New England's major port and the only port in the region providing a full range of container handling, cruise ship, bulk, breakbulk, automobile processing, petroleum and ship repair services. Massport's maritime activities are primarily conducted at Conley Terminal, the Black Falcon Cruise Terminal and the former Boston Army Base in South Boston, as well as Moran Terminal in Charlestown, which is under master lease, and various bulk and breakbulk facilities in both Charlestown and South Boston. These Port facilities handle about 76,000 containers and serve more than 100,000 cruise ship passengers each year.

### Port of Boston Real Estate Properties

Massport's Business Development Department develops and manages Authority-owned real estate within the Port of Boston for maritime, industrial and commercial uses: these development properties are primarily under land lease to third parties. Massport's property ownership encompasses hundreds of acres of land and watersheet located in South Boston, East Boston and Charlestown. Significant Massport holdings in these areas include: Commonwealth Pier 5 (which has been redeveloped as the World Trade Center-Boston), over 45 acres of waterfront development property between Summer Street and Northern Avenue (designated for commercial/office development), the Boston Fish Pier, and other key industrial and development properties located in South Boston; Hoosac Pier in Charlestown; and East Boston Piers, the Piers Park, and a marina and ship repair facility in East Boston.

The Authority's operational and management responsibilities differ from facility to facility.

### Worcester Regional Airport

In April 1999, Governor Paul Cellucci, Lieutenant Governor Jane Swift and Massport's Executive Director Peter Blute announced an agreement between Massport and the City of Worcester that lays the groundwork for Massport to assume operation and ownership of the Worcester Regional Airport. The agreement plots the course for Massport to acquire ownership of the airport by July 1, 2001.

Anticipating this shift in responsibility, Massport Year 2000 Program staff have conducted inquiries at Worcester Airport regarding Y2K readiness, and the Program Office continues to follow the airport's progress. However, until such time as the Port Authority assumes full responsibility for Year 2000 Compliance at Worcester Airport, the Massport Program Office must refer all questions concerning the airport to the City of Worcester. The Program elements described in this Program Summary and related progress reports do not refer to Worcester Regional Airport.

## **THE MASSPORT YEAR 2000 PROGRAM**

### **The Year 2000 Problem and Massport**

Massport's operations are supported by a number of systems which largely depend on computer assisted technology, including those which incorporate embedded chip technology. These Massport systems -- including computer networks and telecommunications infrastructure that support Authority-wide administration and management needs, building systems, and a wide range of computer assisted software, systems and equipment unique to specific operating departments -- are potentially vulnerable to the Year 2000 Problem. Massport has undertaken a Year 2000 Program to achieve Year 2000 Compliance for those systems under the Authority's direct control and responsibility, and will use best efforts to coordinate with others to maintain operational continuity at the facilities owned, controlled and/or managed by Massport into the next century.

Third parties operating at or providing services to Massport properties and facilities are responsible for achieving Year 2000 Compliance for their own systems, operations or services and those provided under agreement to others. Since the actual implementation of Year 2000 plans by third parties is not within Massport's control, the Authority cannot provide assurances with respect to the success of third party efforts or any potential adverse effects on Massport, its tenants or those operating at or on Massport property caused by any failure of these third parties to achieve Year 2000 Compliance. However, the Program Office is evaluating the extent to which Massport's operating systems and facilities may be vulnerable to failures by its major suppliers, distributors, and service providers to become Year 2000 compliant, and intends to take appropriate actions to mitigate such vulnerabilities.

The purpose of the Massport Year 2000 Program is to prepare Massport for the upcoming transition to calendar date 2000. The Year 2000 Program strategy is intended to achieve Year 2000 Compliance for Massport systems, prepare the Authority for potential consequences involving third parties, and document contingency plans and procedures as part of its business continuity plan.

### **The Year 2000 Program Team**

The Massport *Year 2000 Program Office* is located within the Department of Information Services and Telecommunications. The Year 2000 Program is overseen by the Director of Information Services and Telecommunications, and is managed by the Year 2000 Program Manager. The Year 2000 Program Manager is responsible for tracking the progress of the overall program, including individual system compliance activities, contingency planning and documentation of contingency plans and procedures in a business continuity plan.

The *Year 2000 Program Team* is comprised of Year 2000 Program Office staff, key Legal and Risk Management Department advisors, and designated staff from other Massport departments responsible for operations at Logan Airport, Hanscom Airfield, the Tobin Bridge, Maritime facilities, and Business Development facilities, as well as Administration and Finance. When used in this document, *the Year 2000 Team* refers to the staff of the Year 2000 Program Office, legal and risk management advisors, designated staff from other departments, and outside consultants.

The Year 2000 Program Office draws on outside consultants to augment the team's capabilities as circumstances warrant. Consultants may be used to provide individual Year 2000 System Compliance Managers with expertise specific to an individual system, or to a class of system components.

## **YEAR 2000 PROGRAM METHODOLOGY**

The Massport Year 2000 Program is designed to achieve the goal of business continuity through Year 2000, through application of technology-based and (where necessary) operations-based responses to the Year 2000 Problem. These efforts and response plans and appropriate procedures will be documented as part of the Authority's overall business continuity plan.

### **Massport System Compliance**

Massport's Year 2000 Program strategy focuses first on achieving Year 2000 Compliance for those Massport systems deemed critical to the safe and uninterrupted operation of its facilities. The Year 2000 Program is also designed to achieve timely Year 2000 Compliance for non-critical systems, as time and resources allow. The Year 2000 Program incorporates both independent testing and contingency planning elements to achieve a high level of confidence that operational continuity will be maintained even in the unlikely event of critical system failure. As further discussed below, the Massport System Compliance program includes seven phases of evaluation, planning and implementation activities.

Each Massport system identified for evaluation is assigned to a Year 2000 System Compliance Manager drawn from the Year 2000 Team. Each Compliance Manager is responsible for working with the system's users, vendors and others to ensure that compliance is achieved and, where appropriate, that an effective contingency plan is in place.

#### **Phase I: System Inventory**

In order to develop a complete and reliable inventory of automated systems and related equipment, the Year 2000 Team compiled a preliminary list of Massport's automated systems from its own records, then reviewed and refined this list through an interactive and iterative process (including interviews) with Massport operating and support departments. Year 2000 Program Office staff used standardized questionnaires to ensure that the information gathered was both consistent and comprehensive: these questionnaires provide detailed information about both software and hardware components, so that all system components and dependencies are identified for evaluation. (See "*Phase III: System Assessment*".) The Fault Tree Analysis portion of the Year 2000 Program provides another level of review and focused evaluation of the Authority's core processes and the role of the systems which support those processes. Fault Tree Analysis has served to confirm the Massport system inventory, and, in some cases, has led to the identification of additional systems.

The Year 2000 Team has compiled an inventory of over 300 systems.

System inventory data is kept in databases designed to assist the Year 2000 Team in tracking system assessment, compliance status, and progress made against scheduled program tasks. These databases are updated on a regular basis to reflect information obtained and progress made in each phase of the Year 2000 Program.

### Phase II: System Prioritization

Following review and analysis by the Year 2000 Project Team and operating department staff, each system was assigned a priority, based on the system's importance to the Authority's core operations and business activities. Particular attention has been given to the system's impact on safety, health and the environment.

- Mission Critical
- High Priority
- Medium Priority
- Low Priority

Mission Critical systems are those which have been deemed to have implications for health, safety or the environment, and High Priority systems are those which are otherwise key to the Authority's operations or business activities.

The Prioritization phase has been completed.

### Phase III: System Assessment

Each system has been or will be assessed by the Year 2000 Team and/or vendors to determine the system's Year 2000 Compliance status. The system assessment includes identification and evaluation of all system components--hardware, operating system, database system, application information, dependencies on/relationships with other systems, and other relevant factors in order to determine possible "weak links". This information allows the Year 2000 Team to identify those components that require further evaluation, and to determine the methods and resources necessary to confirm and/or achieve compliance.

The System Assessment phase has been completed.

### Phase IV: Year 2000 Compliance Recommendation

Once a system has been assessed, the Year 2000 Team develops recommendations for either achieving Year 2000 Compliance or retiring the system. The recommended action depends upon the system's compliance status and priority, as well as the results of the in-depth assessment. Recommended actions include system upgrade, repair or replacement or system retirement. (Note, however, that the recommendation for system retirement reflects a prior decision by the user group that a system has been or will be retired.)

In the case of new systems and/or other systems in which there is a very high level of confidence in Year 2000 Compliance (as is the case with newly installed and tested systems, or systems for which Massport has received very reliable documentation of compliance), the system is deemed Compliant and no further remediation action is necessary.

Recommended action categories include:

- None                                      System is Year 2000 Compliant
- Repair
- Replace
- Upgrade
- Retire(d).

The System Recommendation phase has been completed.

#### Phase V: Implementation & Testing

The implementation and testing phase includes activities required to implement repair, replacement or upgrade recommendations, and to test the results of this work. The implementation and testing phase requires consideration of the system's priority category, the level of confidence in actions undertaken by others (i.e., vendors and consultants), and the actual complexity of the repair, replacement or upgrade work undertaken. As noted below, systems deemed to be Year 2000 Compliant may also be tested during this phase, on a prioritized basis.

The Implementation & Testing phase is 100% complete for Mission Critical systems, and 99% complete for all systems.

#### Phase VI: Independent Testing, Verification & Validation (TV&V)

Independent Testing, Verification & Validation (TV&V) activities are under way to provide reassurance of certain systems' Year 2000 Compliance status. The Year 2000 Team is engaged in a rigorous TV&V program to verify, test and validate Year 2000 Compliance for mission critical and certain high priority systems.

Verification is an independent assessment to define the functional complexity of a system, the potential impact of the system's failure (the system's criticality), and the level of testing required to gain the requisite level of confidence in the system's Year 2000 Compliance. This information is then compared to the compliance testing completed to date, producing a verification recommendation that defines the level of further testing which should be undertaken. The Verification process also provides a risk / impact assessment of the system, based on the level of confidence in the system (which can be improved through system testing) and the potential impact of the system (which can be reduced through contingency planning). Thus, the Verification process links testing efforts directly to Fault Tree development and the Contingency Planning phase of the Year 2000 Program. As of the end of the 3<sup>rd</sup> Quarter 1999, 136 systems had undergone verification.

Validation refers to the process by which system documentation is independently assessed, and the testing performed to date is found to meet the level of testing recommended during the Verification process. In such a case, a system may be Validated as Year 2000 Compliant. As of the end of the 3<sup>rd</sup> Quarter 1999, the Year 2000 Compliance status of 100 systems had been validated with no further testing required.

Testing refers to the independent testing of systems, based on the systems' potential impact to Safety, Health or the Environment, Operations or Customer Service, and the nature of the system. Test plans are produced and tests are carried out to meet the level of testing recommended in the Verification process. Systems which pass these tests are then independently deemed to be Year 2000 Compliant. As of the end of the 3<sup>rd</sup> Quarter 1999, 31 systems had been independently tested to confirm Year 2000 Compliance status.

As of the end of the 3<sup>rd</sup> Quarter 1999, the Year 2000 Compliance status of 105 mission critical systems (97%) had been tested or otherwise validated. As such the TV&V phase is substantially complete.

#### Phase VII: Contingency Planning

Contingency planning is a critical component of Massport's Year 2000 Program strategy. Contingency Planning aims to enable the continuous provision of a minimum acceptable level of service during times of "crisis", until normal operation can be resumed. The immediate objective of contingency planning is to mitigate the impact of a "crisis" situation, or failure of a key function of the operation, to preserve the basic elements of the critical business process. Because contingency planning aims to preserve a process or function, planning must be driven by the business or operating unit, and must address potential failures of systems, suppliers or business partners that could jeopardize the continuity of a critical business function. In many cases, contingency planning for the Year 2000 transition is merely a process of documenting and formalizing plans that already exist in the day-to-day operating context of each facility.

Contingency plans are generally recommended where there is a low level of confidence in a system, supplier or business partner, the failure of which could cause a serious impact to a critical process or operation – in other words, where there is a high risk which can only be mitigated through contingency planning. In certain cases, the Program Team will perform contingency planning even where there is a high level of confidence in a particular system or third party, if the impact of failure is deemed to be so high as to make the risk unacceptable.

Fault Tree Analysis and TV&V efforts have led to the identification of systems and interdependencies that require contingency planning for each Massport facility. This information has been reviewed with operating and business units for completeness and relevance to maintaining business continuity.

Systems and interdependencies requiring contingency planning have been identified, and more than 100 contingency plans have been developed and quality assured for Logan Airport, Hanscom Field, the Tobin Bridge, Maritime and Business Development operations.

Contingency Planning is complete.

Testing, training and other preparations will continue through the end of the year.

### **Fault Tree Analysis**

The Year 2000 Program incorporates a core process analysis component for the Authority's key operating and business units. The core process analysis, known as Fault Tree Analysis, identifies those operations and related systems and suppliers/service providers that are essential to sustaining the Authority's mission. This evaluation provides a multiple level analysis, which, together with the System Compliance and Third Party Evaluation, provides a comprehensive picture of the Authority's core operations and the elements of those operations necessary to sustain business continuity.

The Program Office has engaged an international consultant with significant airport experience to conduct core process analyses of major Massport operations and business functions. These analyses supplement both the Massport System Compliance and the Third Party Evaluation efforts, by providing an additional level of review and focused evaluation of the Authority's core processes, and the role (and potential impact) of the Authority's systems and third parties in supporting those processes. These analyses emphasize essential areas for independent testing and contingency planning.

Fault Trees have been prepared for each unit highlighting the critical operations of the unit, as well as functional process interdependencies between the operation and supporting systems and suppliers. Fault Tree diagrams developed during the Fault Tree Analysis process are being refined and updated to reflect TV&V, contingency planning and third party evaluation results.

### **Third Party Issues**

The Year 2000 Program deals with third party issues in a number of ways. First, the Massport System Compliance program deals with a number of third party vendors and suppliers to achieve and/or document Year 2000 Compliance for the Authority's technology-based systems. Second, all new operating agreements, purchase orders, maintenance agreements, service agreements, construction contracts and other agreements will include appropriate provisions pertaining to Year 2000 issues. Finally, the Program Office is evaluating the extent to which Massport's operating systems and facilities may be vulnerable to failures by its major suppliers, distributors, and service providers to become Year 2000 Compliant. The Program Office has contacted over 600 vendors, suppliers and service providers. Correlation with Fault Trees helped reduce the list to less than 150 key third parties.

Where the Authority does not have a satisfactory level of confidence in the ability of a critical vendor, service provider or business partner to provide satisfactory products or services during the Year 2000 transition, the Authority is taking appropriate actions to reduce the risk and/or impact which would result from that party's failure to perform. Such actions include seeking alternate suppliers of the relevant product or service, stockpiling, or implementing other contingency plans.

## **Massport Business Continuity Plans**

The Year 2000 Program Office intends to prepare business continuity plans to document the results of the Year 2000 Program effort, including recommended contingency plans and procedures for maintaining business continuity through the Year 2000.

## **Program Management Tools & Due Diligence**

The Year 2000 Program incorporates a number of Program management tools to support the Program and ensure that appropriate due diligence activities are taken. These tools and activities include: periodic briefings of Massport Executive staff and Board of Directors, coordination with senior staff and their designated representatives at each facility, the use of Massport-developed and consultant databases to identify and track Year 2000 Program efforts, and implementation of program documentation procedures. Finally, the Program Office coordinates closely with Massport's Legal and Risk Management Departments at each step of the Year 2000 Program.

## **Program Schedule**

<b>Y2K Program Area</b>	<b>Scheduled Completion Date</b>	<b>Status - 3<sup>rd</sup> Qtr. '99</b>
<b>System Compliance</b>		
Identification	1998	100%
Prioritization	1998	100%
Assessment	December 1998	100%
Recommendation	January 1999	100%
Implementation / Testing	June 1999	99%
TV&V	September 1999	97%
Contingency Planning	September 1999	100%
<b>Third Party Evaluation</b>	September 1999	95%
<b>Fault Tree Analysis</b>	June 1999	100%

To date, the Year 2000 Program has met or substantially met all benchmarks.