

**TRANSPORT CANADA
NASA SPACE SHUTTLE EMERGENCY LANDING SITE CONTINGENCY PLAN
TP12952E**

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PLAN AUTHORIZATION

This contingency plan is effective upon receipt and is for use by Transport Canada staff in monitoring NASA Space Shuttle launches where the NASA Space Shuttle may be required to complete an emergency landing or a crew bailout within the confines of Canadian territory or international waters bordering Canadian Territory. Furthermore, this contingency plan outlines the procedures which will be followed in the event of an actual emergency landing or crew bailout of the NASA Space Shuttle.

The contingency plan has been coordinated with the various components of Transport Canada, the Department of Foreign Affairs and International Trade, the Department of National Defence, the Department of Justice, the Embassy of the United States of America (Ottawa), the United States Department of State and the National Aeronautics and Space Administration of the United States of America.

This contingency plan details the specific responsibilities and obligations of all parties involved in the monitoring of launches and the response to a declared emergency and is intended to amplify the "Agreement on Space Shuttle Emergency Landing Sites in Canada" (Annex A) and agreed to by exchange of diplomatic notes between the Embassy of the United States of America and the Department of Foreign Affairs and International Trade.

Approved by:

Don Spruston
Director General
Civil Aviation

Date: 23 May 1997

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Chief Civil Aviation Contingency Operations Division
Director General Security and Emergency Preparedness
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NAV CANADA

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Canadian Air Traffic Management Unit
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DEPARTMENT OF NATIONAL DEFENCE

National Defence Operations Centre
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DEPARTMENT OF FOREIGN AFFAIRS AND INTERNATIONAL TRADE

DFAIT Operations Centre
Deputy Director Science and Technology
Media Relations Office

GOVERNMENT OF THE UNITED STATES OF AMERICA

Department of State
Assistant Director for Space and Multilateral Cooperation
Embassy of the United States of America (Ottawa) - First Secretary

National Aeronautics and Space Administration
International Relations Division, Washington
Kennedy Space Centre - Ground Operations Manager
Johnson Space Centre - Landing Support

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PLAN OF OPERATIONS

1. SITUATION

The Transport Canada NASA Space Shuttle Emergency Landing Site Contingency Plan is the department's plan detailing measures to monitor NASA Space Shuttle launches at inclinations which traverse the eastern seaboard of Canada. If necessary, the department is prepared to initiate coordinated contingency plans to respond to a declared emergency involving the NASA Space Shuttle. Transport Canada will act as "Lead Department" and coordinate with other Federal Departments, Agencies and Authorities as required. Other participating Departments, Agencies and Authorities are shown at Annex B.

2. MISSION

The purpose of this plan is to respond in a coordinated and effective manner in the unlikely situation where the NASA Space Shuttle declares an emergency and either attempts an emergency landing at one of the designated Canadian aerodromes shown at Annex C, or attempts a bailout of the astronauts from the NASA Space Shuttle in Canadian airspace.

3. EXECUTION

3.1 Concept of Operations

3.1.1 Objective

The primary objective of the Transport Canada NASA Space Shuttle Contingency Plan is to protect human lives by providing continuous monitoring of launches at inclinations which traverse the eastern seaboard of Canada and if necessary invoking emergency procedures to respond to a declared emergency.

3.1.2 Available Resources

The objectives will be achieved by the use of Transport Canada and Nav Canada Headquarters and Regional resources as well as Department of National Defence Regional and site resources.

3.1.3 Command and Control

Transport Canada Headquarters will coordinate and support the expertise and efforts of all federal departments, agencies and authorities involved to ensure an effective response to the situation.

3.2 Phases

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The response to a potential or actual NASA Shuttle Emergency landing will be handled in four phases: preparatory, monitoring, emergency response, and recovery operations.

3.2.1 Phase 1 - Preparatory

Phase 1 includes the establishment of a notification procedure for providing prior notice of scheduled launches of the NASA Space Shuttle at inclinations which traverse the eastern seaboard of Canada and the initial development of regional and site specific contingency plans.

3.2.2 Phase 2 - Monitoring

Phase 2 involves the live monitoring of NASA Space Shuttle launches at inclinations which traverse the eastern seaboard of Canada, by all involved Departments, Agencies and Authorities.

3.2.3 Phase 3 - Emergency Response

Phase 3 involves the implementation of emergency plans to respond to a declared emergency by the NASA Space Shuttle.

3.2.4 Phase 4 - Recovery Operations

Phase 4 involves the implementation of contingency plans to permit the recovery of a NASA Space Shuttle after an emergency landing at a designated aerodrome.

3.3 Tasks

3.3.1 Phase 1- Preparatory

3.3.1.1 Transport Canada will issue a schedule of launches in conjunction with the NASA Johnson Space Centre and confirm flight schedules with the Canadian Air Traffic Management Unit, concerned Area Control Centres, Airports and the Rescue Coordination Centre in Halifax two weeks prior to an actual launch.

3.3.1.2 Transport Canada Atlantic Regional Director General will ensure that Regional Contingency Plans are prepared to monitor launches and if necessary Nav Canada will implement procedures in an emergency to clear Canadian airspace for the safe re-entry of the NASA Space Shuttle to land at a designated aerodrome. In addition, Transport Canada Atlantic Regional Director General will ensure that managers at designated aerodromes prepare contingency plans to respond should the NASA Space Shuttle declare an emergency. These plans will include procedures to ensure that the runway will be cleared at the designated aerodrome and Emergency Response Services will respond in conjunction with established procedures. A copy of these plans will be forwarded to Transport Canada Headquarters (Civil Aviation Contingency Operations Division).

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3.3.1.3 The Department of National Defence will ensure that Regional Contingency Plans are prepared to monitor launches and if necessary implement procedures in a declared emergency to permit the NASA Space Shuttle to land at designated aerodromes under their control. In addition, the Department of National Defence will ensure that Commanding Officers at designated aerodromes prepare contingency plans to respond should the NASA Space Shuttle declare an emergency. These plans will include procedures to ensure that the runway will be cleared at the designated aerodrome and Emergency Response Services will respond in conjunction with established procedures. A copy of these plans will be forwarded to Transport Canada Headquarters, Civil Aviation Contingency Operations Division.

3.3.1.4 The Commanding Officer of the Rescue Coordination Centre, Department of National Defence, in Halifax will ensure that contingency plans are prepared to monitor launches and if necessary implement procedures in a declared emergency to conduct search and rescue activities in accordance with the Multilateral Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.

3.3.2 Phase 2 - Monitoring

3.3.2.1 The Civil Aviation Contingency Operations Division at Transport Canada Headquarters in Ottawa will be in a monitoring posture one (1) hour prior to the scheduled launch time of each NASA Space Shuttle launch at inclinations which traverse the eastern seaboard of Canada. Ten minutes prior to the actual launch time, a live communication net will be established with the NASA Johnson Space Centre in Houston, the Civil Aviation Contingency Operations Division and the Canadian Air Traffic Management Unit in Ottawa, the Area Control Centres at Moncton and Gander, the Rescue Coordination Centre in Halifax, and the Wing Operations Desk at CFB Shearwater. Real time launch and ascent status from final countdown through ascent to orbit (or landing if required) will be provided by the NASA Johnson Space Centre. Air Traffic Control Towers and Flight Service Stations at designated airports will be notified of the launch time, but not linked directly.

3.3.2.2 Emergency Response Services at designated aerodromes will be provided with an advisory by the Civil Aviation Contingency Operations Division.

3.3.2.3 Live launch monitoring will be conducted by all agencies until such time as the NASA Space Shuttle passes the window of opportunity to abort to each designated aerodrome. Each Transport Canada and Department of National Defence component not monitoring the live launch will be advised by the Civil Aviation Contingency Operations Division when the NASA Shuttle has attained orbit.

3.3.2.4 Emergency Response Services at designated aerodromes will be advised by the Civil Aviation Contingency Operations Division when the NASA Space Shuttle safely reaches orbit.

3.3.2.5 In the event of a declared emergency, all agencies will invoke Phase 3 of this contingency plan.

3.3.3 Phase 3 - Emergency Response

3.3.3.1 In the event of a declared emergency by the NASA Space Shuttle, all affected agencies shall implement their contingency plans.

3.3.3.2 Transport Canada will activate the Transport Canada Crisis Centre (TCCC). The TCCC will establish communications directly with the designated aerodrome Emergency Coordination Centre and the Transport Canada Atlantic Regional Crisis Centre as required.

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- 3.3.3.3 The appropriate Area Control Centre will establish a corridor to permit the NASA Shuttle an unobstructed approach to the designated aerodrome as time and traffic permits. The Area Control Centre will communicate with the designated aerodrome to ensure that the appropriate runway is available.
- 3.3.3.4 Site managers will implement their emergency plans taking into consideration the content of the US Department of State Memorandum on Space Shuttle Emergency Support Operations (Annex D). It is critical that responding emergency personnel be aware of the potential hypergolic, cryogenic, pyrotechnic, ammonia and pressure vessels hazards associated with the NASA Space Shuttle.
- 3.3.3.5 Site emergency response personnel will be responsible for maintaining a 400 metre minimum security perimeter and ensure that no personnel enter this perimeter until approved by the NASA Space Shuttle Flight Crew or until the arrival of the NASA Augmentation Team.
- 3.3.3.6 In the event of a nominal landing, the NASA Space Shuttle Crew will be responsible for vehicle safing, vehicle reconfiguration, vehicle systems activation/deactivation and hatch opening and egress.
- 3.3.3.7 If the NASA Space Shuttle does not land at one of the designated aerodromes, the Department of National Defence will implement search and rescue operations from the Rescue Coordination Centre in accordance with the Multilateral Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space and Department of National Defence Standard Operating Procedures.
- 3.3.4 Phase 4 - Recovery Operations
- 3.3.4.1 Recovery operations will commence at the stand down of a declared emergency and may take up to 40 days to complete.
- 3.3.4.2 Site emergency response personnel will maintain the 400 metre minimum security perimeter until the arrival of the NASA Augmentation Team.
- 3.3.4.3 The NASA Augmentation Team will be deployed from Kennedy Space Centre, Florida within eight (8) hours of an emergency landing.
- 3.3.4.4 Upon arrival the NASA Augmentation Team will be responsible to:
- (i) assess the safety configuration of the NASA Space Shuttle;
 - (ii) coordinate towing the NASA Space Shuttle from the runway to a suitable location;
 - (iii) evacuate the flight crew to Johnson Space Centre, Houston, Texas;
 - (iv) remove any necessary articles from the NASA Space Shuttle;
 - (v) coordinate recovery efforts with the designated aerodrome officials; and
 - (vi) prepare for the arrival of the NASA Assessment and Recovery Teams.
- 3.3.4.5 The NASA Rapid Response Team/Mishap Investigation Team will arrive at the designated aerodrome within twenty-four (24) hours of an emergency landing.
- 3.3.4.6 The NASA Rapid Response Team/Mishap Investigation Team will be responsible for:
- (i) conducting an engineering assessment of the NASA Space Shuttle;

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- (ii) provision of a Security Team (to be coordinated with site management and the police force having jurisdiction at the designated aerodrome);
- (iii) provision of a Safety Team; and
- (iv) conducting NASA recovery operations management in coordination with the Airport Manager of the designated aerodrome.

3.3.4.7 Transport Canada Headquarters staff (Civil Aviation Contingency Operations Division) will coordinate with NASA, the Transport Canada Atlantic Regional Crisis Centre and the Airport Manager of the designated aerodrome to facilitate the arrival and logistic requirements of approximately 19 aircraft sorties (13 C-5A Galaxies and 6 C-141 Starlifters) and 400 personnel arriving on a staggered schedule.

4. PLAN RESPONSIBILITY

The Assistant Deputy Minister, Safety and Security is responsible for the update and maintenance of this plan.

5. PLAN UPDATE

The plan will be reviewed yearly and amendments will be issued as required to update the plan as of the first of January each year, or more frequently should the need arise. Amendments will be documented in the amendment sheet and dated.

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ANNEX A

Agreement on Space Shuttle Emergency Landing Sites in Canada

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ANNEX B

Other Participating Departments, Agencies and Authorities

CANADA

Department of Foreign Affairs and International Trade - Headquarters

Department of National Defence - Headquarters

Department of National Defence - Rescue Coordination Centre - Halifax

Department of National Defence - CFB Goose Bay

Nav Canada

UNITED STATES OF AMERICA

United States Department of State

Embassy of the United States of America - Ottawa

National Aeronautics and Space Administration

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ANNEX C

Designated NASA Space Shuttle Emergency Landing Sites in Canada

Gander International Airport, Gander, Newfoundland

Halifax International Airport, Elmsdale, Nova Scotia

St. John's Airport, St. John's, Newfoundland

Stephenville Airport, Stephenville, Newfoundland

CFB Goose Bay, Goose Bay, Newfoundland

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ANNEX D

Space Shuttle Emergency Support Operations

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ANNEX E

LIST OF REFERENCES

Multilateral Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.

Multilateral Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies.

Agreement Among the Government of the United States of America, Governments of Member States of the European Space Agency, The Government of Japan, and the Government of Canada on Cooperation in the Detailed Design, Development, Operation, and Utilization of the Permanently Manned Civil Space Station.

Outer Space Convention on International Liability for Damage caused by Space Objects.