Meteorological Service of Canada Business Continuity Management Plan Overview

MSC – a mission-critical organisation

Environment and Climate Change Canada (ECCC)'s Meteorological Service of Canada (MSC) is a 24-7 Canada-wide mission-critical organisation. It is responsible for safeguarding the Canadian population and its infrastructure by providing to the public, Emergency Measures Organizations (EMOs), the Government of Canada and provincial and territorial governments, and various other socio-economic, environmental and health sectors with weather observations, forecasts, and warnings regarding extreme meteorological, marine and ice conditions. Through its extensive hydrometric network data, and its engineering and technical expertise, the MSC also supports water quantity management decision making by provinces and territories, and domestic and international water boards.

In addition, MSC maintains a unique expertise and delivers services that are vital for response to pollution, nuclear incidents. Its expertise includes the development, implementation and maintenance of numerical weather and environmental modelling capacity in coordination Shared Services Canada (SSC), which is responsible for the supercomputing infrastructure and networks on which MSC's modelling capacity and product delivery systems rely on.

The Branch works in close partnership with ECCC's Corporate Services and Finance Branch for critical IT application development and maintenance; real property support, and security all of which is important in supporting business continuity.

MSC's Organisational Structure

The MSC is headed by an Assistant Deputy Minister (ADM) and is structured in four main directorates:

- Canadian Centre for Meteorological and Environmental Prediction (CCMEP) directorate: Responsible for the development and the real-time operational, year-round, 24/7 capacity of the Department to operate numerical weather and environmental prediction models critical to the mandate of the MSC. This directorate also provides environmental emergency response on a 24/7 basis to releases of nuclear and toxic material, volcanic ash, air quality incidents during the forest fire season as well as longer term forecasts of high impact events, linking with specialised users such as the Government Operations Centre, the National Environmental Emergencies Centre and others. It supports international mandates for emergency response as a Regional Specialised Meteorological Centre. Finally, the Directorate takes the lead for putting in place the MSC Crisis Management Team in situations which warrants this.
- Prediction Services Directorate (PSD): Responsible for the production and delivery of weather and environmental forecasts, warnings and special weather statements for Public, Marine, Hurricane and Air Quality services on a 24/7 basis across the country and provides consultation and advice to Emergency Management Organizations (EMOs) at all levels of government. PSD is also responsible for the development and delivery of weather and related environmental products and information to meet the needs of Canadians, economic sectors, other federal departments, and external clients. This includes the provision of weather, ice and other environmental prediction data to support Canadian aviation, navigation and military operations, all of which are critical services.

- Monitoring and Data Services Directorate (MDSD): Ensures that meteorological, climatological, hydrometric and environmental observations and information are collected, managed and disseminated for use within the MSC, within Canada, and internationally. The program also has obligations relating to design and operation of complex networks critical to MSC's mandate, data standards, and quality assurance. The National Hydrological Service, part of MDSD, operates through formal agreements with the provinces and territories under the Canada Water Act providing data and information for water management decisions in the stewardship of fresh water.
- Policy, Planning and Partnerships (PPP) Directorate: Leads policy and planning for the MSC and manages MSC's Quality Management System, registered to the ISO 9001:2015 standard.

Business Continuity Management Planning

The main objectives for Business Continuity Management are to:

- Maintain continuity of operations in delivering MSC's critical services;
- Contribute to maintaining public confidence and maintaining the health, safety and security of the Canadian public; and
- Protect national critical infrastructure for which MSC is the custodian.

The Business Continuity Management Plan (BCMP) for the MSC, and their associated contingency plans and related documents, focus on a prioritized list functions, operations, and activities for the Government of Canada, including the maximum allowable downtimes (see Annex 1), and the considerations from key clients and users. The Plan identifies the critical functions, information technology (IT) systems, and assets needed to ensure the continued availability of MSC critical data and services. It is activated in situations of reductions in, or loss of, human resource capacity, IT, and/or real property. Requirements for IT-specific support are addressed in Business Impact Analyses (BIA) and specific Service Level Agreement with Shared Services Canada. The MSC BCMP supports the departmental BCMP.

The activation of the MSC BCMP may occur through the recommendation of the MSC Crisis Management Team, directly at the recommendation of the DG CCMEP in collaboration with other DGs, or at the discretion of the MSC ADM. Contingency plans are in place at local and Directorate levels that outlines actions to be taken in response to local events. These contingency plans align and form part of the escalation process in business continuity planning and response.

In the event that local and directorate level contingencies fail, the ADM of MSC and the rest of MSC's senior Management Team are immediately notified by the affected program's Director General. The MSC Crisis Management Team is then activated by CCMEP's DG to provide strategic direction regarding the continued delivery of critical services, nationally. Once activated, the MSC Crisis Management Team is kept briefed on the situation and provides direction as required.

The BCMP is intended to manage temporary business disruptions lasting up to 30 days. Business continuity planning is based on two main scenarios:

- Workforce disruption, where sufficient staff may be unable to report for duty, such as in a pandemic or in situations where number of staff is insufficient to carry out critical services.
- Infrastructure outage, where premises or infrastructure used by the Branch may be non-available or unusable.

The BCMP is regularly reviewed and exercised. Lessons learned are integrated back into the plan. For situations beyond 30 days, the MSC revisits the plan and adjusts it as well as supporting procedures accordingly. The following tables show the types of critical functions the MSC supports and the approximate number of staff who may be drawn upon during a contingency event. In most cases only a subsections of employees are implicated in the response to any individual incident.

Service Prioritization:

	Critical Service/Critical Support Function Maximum Allowable Downtime (MADT)	Readiness	Service Priority Level
1	A service that is continuously delivered and for which the MADT is 0 < 4 hours.	Fully developed plans, arrangements and procedures. Emergency or alternative infrastructure is hardwired and regularly tested. Plans are periodically exercised, assessed and reviewed.	1
2	A contingency service which, for activation, requires a readiness level equivalent to a MADT of 0 < 4 hours.	Fully developed plans, arrangements and procedures. Plans are periodically exercised, assessed and reviewed.	
3	A service for which the MADT is between 4 and 48 hours.	Implementation of fully developed plans can be coordinated within 48 hours.	2
4	A service for which the MADT is between 48 hours and 7 days.	Minimized services using default measures such as tele-work can be established after an interruption of up to 48 hours, and until broader recovery options can be developed, with departmental assistance, into plans that are executable within the MADT.	
5	A service for which the MADT is between 7 and 30 days.	Minimum procedures, such as the ability to recall an EMT are in place, allowing the development and implementation of appropriate recovery plans within the MADT.	3

Summary Description of priority critical service functions*:

*Note that additional staff supporting planning and management activities may also be asked to support critical service work. Numbers outlined below are approximate and the same employees may support multiple functional areas.

Functional Area	Critical Services	Critical Service priority level 1	Number of MSC Staff	Sites
Weather and Environmental Prediction Services	**Regional Storm Prediction Centres (SPCs)**	• Maintain a 24/7 weather watches, warning and other products	There are 7 regional SPCs (total staff ~190) across Canada, at the following locations: Note: Number of staff may vary as a function of assignments and leave.	Vancouver, Edmonton, Winnipeg, North York, Montréal, Dartmouth, Gander
Weather and Environmental Prediction Services	**Canadian Meteorological Aviation Centres (CMACs)**	• Maintain a 24/7 weather watch and produce key products for aviation	There are 2 CMACs in Canada (total staff approx. 80) Note: Number of staff may vary as a function of assignments and leave.	Edmonton, Montréal
Weather and Environmental Prediction Services	**Weather and Environmental Consultation**	• Provide meteorological advice/consultation and information in support of Emergency Management Organizations, other government departments and media.	Warning Preparedness Meteorologists and Decision support staff: Approx. 25 staff across Canada (including management);	Vancouver, Edmonton, Winnipeg, North York, Ottawa, Gatineau, Montréal, Dartmouth, Gander
Weather and Environmental Prediction Services	**Analysis & Prognosis (A&P); Operational Support and Implementation (CMOI); and Environmental Emergency Response Section (EERS)**	• Monitoring and evaluation of numerical prediction models. • Maintain a 24/7 weather watch. Produce special products as needed • Maintenance of automated Operational NWEPS. Implementation of changes to the operational suite. • Emergency response and products with respect to volcanic ash (VAAC), nuclear radiation (provision of trajectories and dispersion models) as performed by RSMC and other toxic atmospheric releases.	Approximately 70 staff Note: Number of staff may vary as a function of assignments and leave.	Dorval
Ice Warnings, Forecasts and Information Services	**Sea Ice and Great Lake Ice forecasts and warnings; ice charts, iceberg bulletins, oil spill monitoring; satellite imagery ordering; dynamic website.**	• Produce and disseminate ice data, products and services Key client support to the Canadian Coast Guard	Approximately 30 staff	Ottawa

Functional Area	Critical Services	Critical Service priority level 1	Number of MSC Staff	Sites
Military Forecasts and Training for DND	**Mission Critical forecasts, warning, aviation related products, briefing services**	• Produce and disseminate mission critical forecasts and products • Maintain a weather watch	Approximately 50 staff	Oromocto, Esquimalt, Halifax
Service Dissemination Systems	**Dissemination on websites, mobile App, Alert ready, e-mail, Weather radio, specialized data services, telephone consultation services**	• Dissemination on multiple platforms, consultation services, data services	Approximately 40 staff	Dorval Gatineau North York Vancouver, Edmonton, Regina, Winnipeg, North York, Ottawa, Montréal, Fredericton, Dartmouth
Atmospheric Monitoring Networks	**Radar, upper air, surface weather (surface weather, climate and aviation), lightning, satellite network maintenance and repair, data management.**	• Oversight, maintenance, repair of observation collection, transmission, infrastructure assets and data management systems	Approximately 200 staff	North York multiple locations including warehouses, staging areas, and offices
MDSD, National Hydrological Services (NHS)	**Acquisition of field data; Provisional QA/QC performed on data; Dissemination of data and information in real-time; Facilitation of dam releases changes in accordance with international regulatory requirements**	• Measurement of stream flows (surge) • Provisional QA/QC performed on data (surge) • Dissemination of data and information in real-time • Forecast water levels in the Great lakes-St. Laurent system, to advise the IJC on reservoir releases in accordance with international regulatory requirements	Approximately 255 staff	Whitehorse, Yellowknife, Vancouver, Cranbrook, Nanaimo, Prince George, Richmond, Terrace, Vernon, Calgary, Regina, Winnipeg, Thunder Bay, North Bay, Burlington, Cornwall, Ottawa, Gatineau, Fredericton, Dartmouth, Mount Pearl

Experience from COVID-19

COVID-19, as well as the H1N1 Pandemic, brought to light the vulnerability of systems if we do not take into consideration the potential diminishing availability of staff to perform their duties, including those of supporting organisations, as well as upstream organisations and suppliers.

From this recent experience, lessons learned in carrying out our Business Continuity Measures include:

- Adjusting governance and understanding roles and responsibilities;
- Having up to date and tested contingency plans;
- Ensuring critical services and products aligned with user requirements;
- Aligning capacity of supporting critical services with MSC's critical services requirements;
- Minimizing risk to people through enhanced safety measures such as physical distancing of specialized equipment, isolation, or other suitable measures;
- Efficient communication messaging;
- The need for up to date contact lists;
- Surge and back up knowledge of procedures, and cross training capacity within and between organizations;
- Sharing of information; and
- Integrating lessons learned, flexibility, adaptability and working with others.