



**Report of the Auditor General of Canada
to the Board of Trustees of the
National Museum of Science and Technology**

Independent Auditor's Report

Special Examination—2019



Office of the
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of Canada

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Special examination reports

Special examinations are a form of performance audit that is conducted within Crown corporations. The Office of the Auditor General of Canada audits most, but not all, Crown corporations.

The scope of special examinations is set out in the *Financial Administration Act*. A special examination considers whether a Crown corporation's systems and practices provide reasonable assurance that its assets are safeguarded and controlled, its resources are managed economically and efficiently, and its operations are carried out effectively.

More details about the audit objective, scope, approach, and sources of criteria are in About the Audit at the end of this report.

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Cat. No. FA3-149/2019E-PDF
ISBN 978-0-660-29169-7





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22 January 2019

To the Board of Trustees of the National Museum of Science and Technology:

We have completed the special examination of the National Museum of Science and Technology in accordance with the plan presented to the Finance, Audit and Risk Management Committee of the Board of Trustees on 25 April 2018. As required by Section 139 of the *Financial Administration Act*, we are pleased to provide the attached final special examination report to the Board of Trustees.

The Office of the Auditor General of Canada will present this report for tabling in Parliament shortly after it has been made public by the National Museum of Science and Technology.

I would like to take this opportunity to express my appreciation to the Board members, management, and the Corporation's staff for the excellent cooperation and assistance offered to us during the examination.

Yours sincerely,

Dusan Duvnjak, CPA, CMA, MBA
Principal

Table of Contents

Introduction	1
Background	1
Focus of the audit	2
Findings, Recommendations, and Responses	3
Corporate management practices	3
The Corporation had weaknesses in some corporate management practices	3
Management of operations	11
The Corporation had a significant deficiency in collection management practices, due to several weaknesses	11
Conclusion	22
About the Audit	23
List of Recommendations	27

Introduction

Background

Role and mandate

1. The National Museum of Science and Technology is a federal Crown corporation that aims to foster scientific and technological literacy throughout Canada. To do this, it establishes, maintains, and develops a collection of scientific and technological objects, with a special focus on Canada. The purpose of the collection is to show the economic, social, and cultural effects of science and technology on society. The Corporation reports to Parliament through the Minister of Canadian Heritage.

Nature of business and operating environment

2. Under its branded identity as Ingenium—Canada’s Museums of Science and Innovation—the Corporation operates three museums in Ottawa, Ontario (Exhibit 1):

- the Canada Science and Technology Museum,
- the Canada Aviation and Space Museum, and
- the Canada Agriculture and Food Museum.

Exhibit 1 The Corporation’s three museums

		
Canada Science and Technology Museum	Canada Aviation and Space Museum	Canada Agriculture and Food Museum
Photos: National Museum of Science and Technology		

3. The flagship Canada Science and Technology Museum was shut down in September 2014. The shutdown, initially expected to last several months to remediate safety hazards, turned into a complete reconstruction and exhibition renewal, at a cost of about \$76 million. The Corporation focused much of its resources and attention in recent years toward the reconstruction and reopening of this museum in November 2017. The Corporation is also building a new Collections

Conservation Centre, at a cost of \$150 million, to provide more capacity and suitable conditions to house its collection. The move into the building was expected to begin at the end of 2018.

4. In the 2017–18 fiscal year, the Corporation spent approximately \$47 million on operating the three museums, of which the federal government provided approximately \$34 million. The remainder was mainly revenue raised through operational activities and contributions. The Corporation had 235 full-time-equivalent employees and 289 volunteers.

Focus of the audit

5. Our objective for this audit was to determine whether the systems and practices we selected for examination at the National Museum of Science and Technology were providing it with reasonable assurance that its assets were safeguarded and controlled, its resources were managed economically and efficiently, and its operations were carried out effectively as required by section 138 of the *Financial Administration Act*.

6. In addition, section 139 of the *Financial Administration Act* requires that we state an opinion, with respect to the criteria established, on whether there was reasonable assurance that there were no significant deficiencies in the systems and practices examined. A significant deficiency is reported when the systems and practices examined did not meet the criteria established, resulting in a finding that the Corporation could be prevented from having reasonable assurance that its assets are safeguarded and controlled, its resources are managed economically and efficiently, and its operations are carried out effectively.

7. Based on our assessment of risks, we selected systems and practices in the following areas:

- corporate management practices, and
- management of operations.

The selected systems and practices and the criteria used to assess them are found in the exhibits throughout the report.

8. We did not examine the systems and practices to manage the reconstruction and the exhibition renewal of the Canada Science and Technology Museum, which took place before the period covered by the audit.

9. More details about the audit objective, scope, approach, and sources of criteria are in **About the Audit** at the end of this report (see pages 23–26).

Findings, Recommendations, and Responses

Overall message



10. Overall, we found that the many weaknesses in how the Corporation managed, protected, and preserved its collection—its fundamental asset—amounted to a significant deficiency. The Corporation housed a large portion of its collection in leased storage facilities, along with a large number of objects that had yet to be assessed, catalogued, and added to the collection. The Corporation had not developed plans to resolve its backlog of uncatalogued objects, or to implement the collection rationalization project that it had started in 2007 to improve documentation of some of its artifacts. Conditions in the facilities were poor, presenting a high risk of deterioration, damage, or theft. This risk will remain high until the collection is moved over the next few years into the Collections Conservation Centre, currently under construction. Moreover, the Corporation had not followed all of its own conservation requirements, putting the integrity of the collection at further risk.
11. Apart from the significant deficiency, after focusing for the last few years on the reconstruction and recent reopening of the Canada Science and Technology Museum, the Corporation now needs to update its policies and formalize processes for developing exhibitions and public programs.
12. On the corporate management side, we found weaknesses in how the Corporation monitored compliance with laws, regulations, and policies, and in how it managed known corporate risks. The Corporation was also waiting for government appointments of a new Chairperson and Vice-Chairperson of the Board, as the incumbents could not be reappointed.

Corporate management practices

The Corporation had weaknesses in some corporate management practices

What we found

13. We found that the Corporation had several weaknesses in corporate management practices. Some of these related directly to issues found in the Corporation's management of operations. For example, the Board did not receive comprehensive information on collection management and did not systematically monitor compliance with laws, regulations, and policies on the development of exhibitions and public programs. Likewise, the Corporation's performance indicators for its strategic objectives did not provide a clear picture of its collection. We also found that the Corporation's risk management lacked rigour—for example, it did not identify mitigation responses to some of its top risks. Finally, the terms of the Chairperson and Vice-Chairperson of the Board had expired, but the search for replacements had not formally begun.

14. Our analysis supporting this finding discusses the following topics:

- Corporate governance
- Strategic planning
- Corporate risk management

Context

15. The Board of Trustees is accountable for the overall stewardship of the Corporation and for ensuring that the Corporation's business activities contribute to achieving its mandate. During the period of the audit, the Board included up to 11 trustees, who were appointed by the Minister of Canadian Heritage with the approval of the **Governor in Council**, a process outside the Corporation's control. The Board was supported by three standing committees: Executive; Finance, Audit and Risk Management; and Governance. The Board also established an ad hoc Major Facilities Committee to oversee the reconstruction of the Canada Science and Technology Museum and the construction of the new Collections Conservation Centre.

Recommendations

16. Our recommendations in this area of examination appear at paragraphs 22, 25, 30, and 35.

Governor in Council—The Governor General, acting on the advice of Cabinet, as the formal executive body that gives legal effect to those decisions of Cabinet that are to have the force of law.

Corporate governance

17. **Analysis.** We found that the Corporation had good practices in corporate governance but had weaknesses in Board oversight and appointments (Exhibit 2).

Exhibit 2 Corporate governance—key findings and assessment











Systems and practices	Criteria used	Key findings	Assessment against the criteria
Board independence	The Board functioned independently.	<p>The roles and responsibilities, authorities, and accountabilities for the Board and its committees enabled their independence from day-to-day management.</p> <p>The Board held in camera sessions without management in attendance.</p> <p>The Board sought declarations of conflicts of interest at the beginning of its meetings, and it documented responses in the minutes. Members were reminded that they were subject to the <i>Conflict of Interest Act</i>.</p>	
Providing strategic direction	The Board provided strategic direction.	<p>The Board provided strategic direction through review and approval of corporate plans prepared by management.</p> <p>The Board set the President and Chief Executive Officer's annual objectives, which aligned with the Corporation's strategic direction.</p>	
Board oversight	The Board carried out its oversight role over the Corporation.	<p>The Board regularly discussed the Corporation's financial status, progress against targets, and various initiatives, including the progress of major construction projects.</p> <p>The Board assessed the President and Chief Executive Officer's performance against set objectives.</p> <p>Internal Audit contributed to the Board's oversight through an annual audit.</p> <p>Weaknesses</p> <p>The Board did not receive from management complete information on how the collection was being managed.</p> <p>The Board did not monitor compliance with key requirements of laws, regulations, and policies.</p>	
Legend—Assessment against the criteria  Met the criteria  Met the criteria, with improvement needed  Did not meet the criteria			

Exhibit 2 Corporate governance—key findings and assessment (continued)

Systems and practices	Criteria used	Key findings	Assessment against the criteria
Board appointments and competencies	The Board collectively had capacity and competencies to fulfill its responsibilities.	<p>The Board determined the skills and expertise it needed to be effective.</p> <p>The Board periodically assessed whether its trustees had the appropriate skills and knowledge to carry out their responsibilities.</p> <p>The Corporation communicated the needed skills and experience for Board trustees to the Department of Canadian Heritage.</p> <p>The Corporation provided orientation and information sessions to Board trustees when needed.</p> <p>Weakness</p> <p>The Chairperson's term had expired and the Vice-Chairperson's term was to expire in June 2018. They were not eligible for reappointment, and the search for replacements had not begun.</p>	
Legend—Assessment against the criteria <ul style="list-style-type: none">  Met the criteria  Met the criteria, with improvement needed  Did not meet the criteria 			

18. **Weaknesses—Board oversight.** We found weaknesses in the Board's oversight of the Corporation's collection management and compliance with key requirements of laws, regulations, and policies.

19. For example, the Corporation had several weaknesses in its collection management, including a backlog of unprocessed objects and a failure to follow some conservation and acquisition requirements (detailed in paragraphs 48 to 53). The Board's ability to oversee this area was hindered because comprehensive reporting on collection management was not in place. Compounding this, the fact that meaningful performance indicators were not in place (paragraphs 27 and 28) limited the Board's ability to, for example, understand progress toward rationalizing the Corporation's collection and addressing its backlog.

20. We also found that the Board had not formally articulated the need to monitor compliance with various laws, regulations, and corporate policies in any of its committees' terms of reference. So, these committees did not identify and request information they needed to monitor this compliance. We found instances where some aspects of corporate policies that had been approved by the Board were not guiding the Corporation's decisions and actions, as described in paragraphs 59 to 61.

21. These weaknesses matter because the Board needs relevant information to ensure that core operations are managed well and that the Corporation complies with applicable laws and regulations, and corporate policies.

22. **Recommendation.** The Corporation's management should work with the Board to identify key information that it should provide to the Board for effective oversight of its collection management and key legal, regulatory, and policy requirements. The Board should also monitor the Corporation's compliance with those requirements.

***The Corporation's response.** Agreed. Over the 2018–19 fiscal year, management will work with the Board of Trustees, to identify key information that will enable strengthened monitoring and reporting on collection management and on compliance with legislation, regulations, and policies.*

23. **Weakness—Board appointments.** The *Museums Act* requires the Corporation to have a Chairperson and Vice-Chairperson of the Board. The Chairperson's term expired in January 2018. After the period covered by the audit, the Vice-Chairperson's term expired as well (in June 2018). Both continued in office while awaiting appointment of successors, as permitted under the Act. The incumbents could not be reappointed, as they had served the maximum number of consecutive terms allowed by the Act. By the time the Vice-Chairperson's term expired, the government had not published notices of opportunity for either position to invite candidates to apply and to allow the selection process to begin. This process was outside the Corporation's control.

24. This weakness matters because the Chairperson and Vice-Chairperson perform important leadership roles; delays in appointments may affect the ability of the Board to provide direction and effective oversight, make decisions, and take action when necessary.







25. **Recommendation.** The Corporation should continue to engage with the Minister of Canadian Heritage for the appointment of a Chairperson and Vice-Chairperson of the Board with the necessary skills and experience, as identified by the Corporation.

***The Corporation's response.** Agreed. Management will continue to work with the Minister of Canadian Heritage toward the appointment of a Chairperson and Vice-Chairperson of the Board with the necessary skills and experience as identified through the Board skills matrix, and its assessment of any gaps in skills and experience on the Board.*

Strategic planning

26. **Analysis.** We found that the Corporation had good practices in strategic planning processes and performance monitoring and reporting, but improvement was needed in performance measurement (Exhibit 3).

Exhibit 3 Strategic planning—key findings and assessment

Systems and practices	Criteria used	Key findings	Assessment against the criteria
Strategic planning processes	The Corporation established a strategic plan and strategic objectives that were aligned with its mandate.	The Corporation's strategic direction was Board-approved and aligned with its mandate and enabling legislation. The Corporation took into consideration its internal and external environments when preparing its corporate plan.	
Performance measurement	The Corporation established performance indicators in support of achieving strategic objectives.	The Corporation established strategies and performance indicators for strategic objectives that were aligned with the Corporation's strategic direction. Weakness The Corporation's performance indicators for its strategic objectives did not contribute meaningfully to the assessment of its collection management.	
Performance monitoring and reporting	The Corporation monitored and reported on progress in achieving its strategic objectives.	The Corporation's executive management met regularly to discuss the Corporation's performance. It formally assessed financial and operational performance each quarter. The Corporation published its 2016–17 annual report and held an annual public meeting.	
Legend—Assessment against the criteria  Met the criteria  Met the criteria, with improvement needed  Did not meet the criteria			

27. **Weakness—Performance measurement.** The Corporation's 2017–18 to 2021–22 corporate plan outlined several strategic objectives. These were accompanied by initiatives, performance indicators, and targets to help the Corporation monitor whether it had achieved these objectives. We found that, for the Corporation's strategic objective of having a best-in-class collection, the key performance indicators and targets did not contribute to clear assessment of the Corporation's collection management.

28. One of these performance indicators related to the percentage of the collection that the Corporation had digitized. However, we found that the indicator was not clear. For example, the collection included artifacts, library materials, and archival items, but the indicator related to only a portion of the artifacts. Another indicator related to the amount of space measured in square metres cleared by removal of objects from storage. We did not find corporate indicators that would help monitor progress on resolving some of the Corporation's important collection-related challenges, such as the backlog of uncatalogued objects and improving documentation of older artifacts (detailed in paragraphs 48 to 53).

29. This weakness matters because relevant indicators and targets would allow the Corporation to better assess how it is developing and managing a best-in-class collection, which is central to its mandate of fostering scientific and technological literacy.







30. **Recommendation.** The Corporation should reassess its performance indicators and targets to enable it to measure progress toward resolving collection management challenges and more meaningfully assess achievement of its strategic objective of having a best-in-class collection.

***The Corporation's response.** Agreed. Management will review the performance indicators for its strategic objective of having a best-in-class collection, as part of developing a new performance measurement framework over the 2019–20 fiscal year. This framework will align with the next five-year strategic plan (2020–2025).*

Corporate risk management

31. **Analysis.** We found that the Corporation had good practices in risk identification and assessment, but improvements were needed in risk mitigation, monitoring, and reporting (Exhibit 4).

Exhibit 4 Corporate risk management—key findings and assessment

Systems and practices	Criteria used	Key findings	Assessment against the criteria
Risk identification and assessment	The Corporation identified and assessed risks to achieving strategic objectives.	The Corporation identified corporate risks and assessed their likelihood and impact. The Corporation had recently updated its risk management policy and had begun developing an integrated risk management framework.	
Risk mitigation	The Corporation defined and implemented risk mitigation measures.	The ad hoc Major Facilities Committee managed the risks of the Corporation's major construction projects, which constituted one of its top corporate risks. Weaknesses The Corporation had not formally defined and documented its risk tolerance levels. The Corporation did not develop an action plan with timelines on ways to mitigate some of its top risks.	
Risk monitoring and reporting	The Corporation monitored and reported on the implementation of risk mitigation measures.	The Corporation reported summary information on top risks to the Board and to the government through its corporate plan. Weakness The Corporation did not systematically monitor and report on risks.	
Legend—Assessment against the criteria  Met the criteria  Met the criteria, with improvement needed  Did not meet the criteria			

32. **Weaknesses—Risk mitigation, monitoring, and reporting.** The Corporation ranked the risks it faced by their likelihood and impact. It also identified broad risk mitigation strategies, which it assigned to specific officials. However, we found weaknesses in the way that the Corporation managed some of its top corporate risks:

- The mitigating strategies were not linked directly to the top risks, but rather to more general functional areas or subjects—such as financial and reputational threats. A clear set of actions, embodied in a mitigation strategy, would have formed a basis for the Corporation to monitor progress. For example, when the Corporation assessed

the move to the Collections Conservation Centre as one of its top risks, it did not identify mitigating strategies to show what actions it would take in response, or when. A detailed risk assessment was prepared much later (paragraph 53).

- Some of the mitigating strategies were vague or outdated. For example, for infrastructure risks, the Corporation had a general mitigating strategy that consisted of continuous reporting to government stakeholders. However, this strategy did not specify when or what the Corporation would report, or what specific risks it would address. Also, components of the information technology disaster recovery plan, which was a mitigating strategy for information technology risks, were undeveloped.

33. We also found that the Corporation had not formally defined and documented risk tolerance levels. These would establish, in advance, how much risk the Corporation would accept in a given area before responding with specific measures.

34. These weaknesses matter because the risks that the Corporation has identified pose threats to its collection, its offerings to the public, and other areas. Specific actions and timelines in risk responses, presented consistently at a corporate level, would provide management and the Board with a basis for comprehensively and systematically monitoring how top risks are managed.

35. **Recommendation.** The Corporation should establish risk tolerance levels and manage its risks with action plans that are specific, time-bound, and measurable. The Corporation should then monitor how the risks are managed.

The Corporation's response. Agreed. Over the 2019–20 fiscal year, the Corporation will continue to develop and implement the integrated risk management framework, including defined risk tolerances and measurable action plans, to enable proactive risk management practices.

Management of operations

The Corporation had a significant deficiency in collection management practices, due to several weaknesses

What we found

36. We found that the Corporation had several important weaknesses in the management of its collection. Combined, these weaknesses amounted to a significant deficiency because the collection was the Corporation's fundamental asset for achieving its mandate. Notably, the Corporation lacked plans to address long-standing documentation initiatives and address backlog issues, and lacked rigour in following its collection management requirements. It also lacked appropriate storage facilities

and access controls to protect its collection from deterioration, damage, or theft. Though the Corporation was building a new storage facility to resolve its storage issues, the move was expected to begin at the end of 2018 and to be completed over the next few years. Until then, unmoved objects would remain at risk of deterioration or damage. Apart from the significant deficiency, we found that improvements were needed in the Corporation's operational planning. Finally, we found that the Corporation's policies and guidelines on exhibitions and programs needed updating and clarification, which would help to communicate corporate expectations and, in turn, strengthen compliance.

37. Our analysis supporting this finding discusses the following topics:

- Operational planning and reporting
- Collection management
- Exhibition and public program management

Context

38. The Corporation's key business activities consisted of research-based development and maintenance of its collection, and establishing exhibitions and public programs. The collection was managed mainly at the corporate level, while the three museums managed their exhibitions and public programs individually.

39. **Collection.** The Corporation's collection included artifacts, library materials, and archival items. Artifacts are human-made objects of historical significance, while library materials typically consist of published items such as books and journals, and archival items include various documents, drawings, and photographs that have not been published elsewhere. The Corporation also had lots of one or more objects that had to be processed before they could be made accessible to the public, and an inventory of items that would be either disposed of or kept as spares (Exhibit 5).

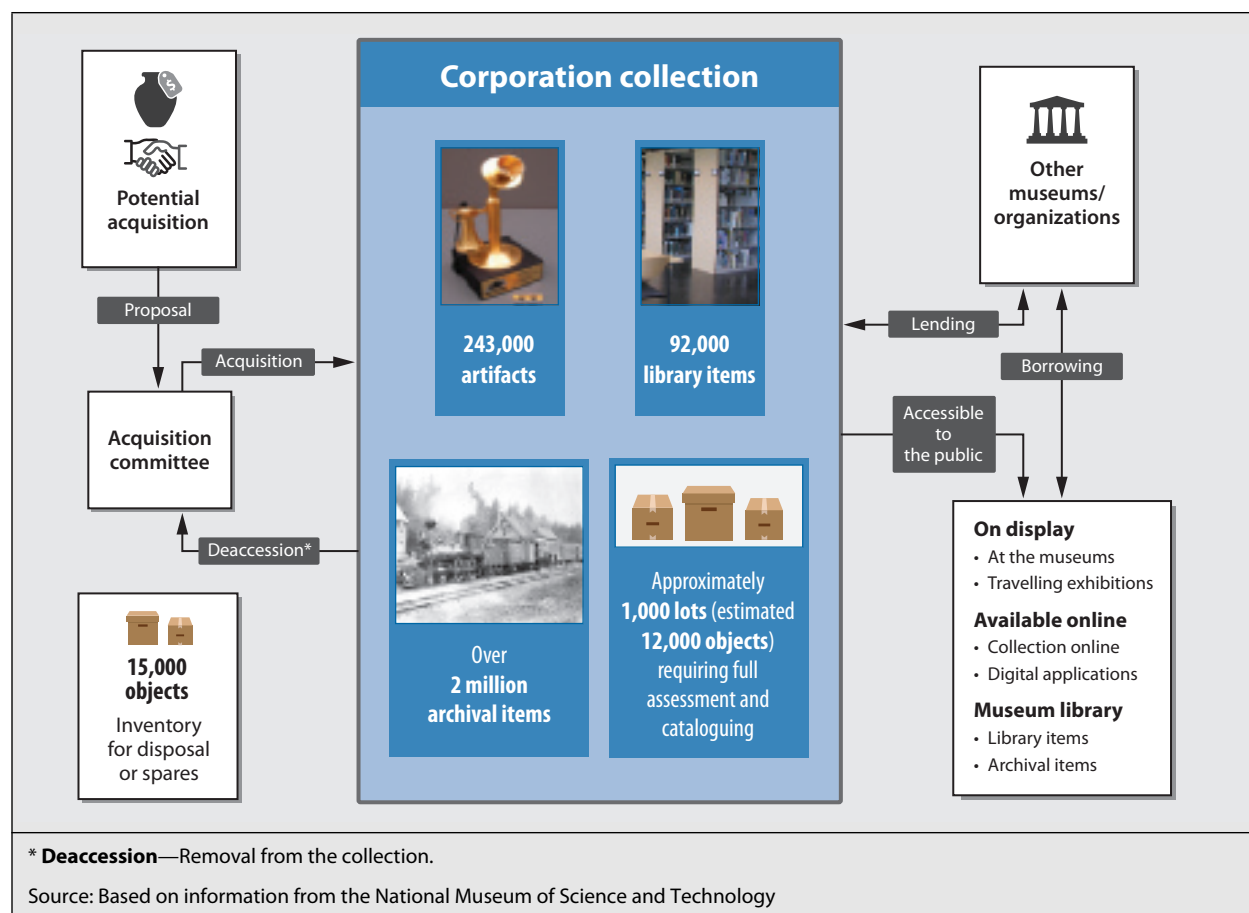
40. **Exhibitions and public programs.** Exhibitions and public programs were the Corporation's primary means of demonstrating science and technology. Exhibitions are displays that are designed to work together thematically in a museum gallery or hall. The Corporation's categories of exhibitions included permanent, long-term, and special (depending on how long they were on display), as well as borrowed and travelling exhibitions. Examples of the Corporation's recent exhibitions include

- Canola! Seeds of Innovation, a permanent exhibition at the Canada Agriculture and Food Museum, to mark the 50th anniversary of canola as a "made in Canada" crop;
- Ace Academy: Flight Experience, a travelling exhibition developed by the Canada Aviation and Space Museum, to provide an immersive experience of flying a Sopwith Ship Camel biplane; and

- The Art of the Brick, a borrowed exhibition hosted at the Canada Science and Technology Museum, to feature a critically acclaimed collection of artwork made entirely from an iconic toy.

Public programs comprised demonstrations, educational programs, and special events.

Exhibit 5 Collection management at the Corporation








Recommendations

41. Our recommendations in this area of examination appear at paragraphs 46, 55, 56, 57, and 63.

Operational planning and reporting

42. **Analysis.** We found that the Corporation had a weakness in operational planning (Exhibit 6).

Exhibit 6 Operational planning and reporting—key findings and assessment

Systems and practices	Criteria used	Key findings	Assessment against the criteria
Operational planning	The Corporation defined operational plans that were aligned with strategic plans and the mandate.	<p>When developing its annual operational plans, the Corporation considered linkages of planned activities to corporate strategic objectives. Those links were also included in employees' performance objectives.</p> <p>The Corporation determined priorities for the year through strategic planning meetings at two of the Corporation's three museums.</p> <p>Weakness</p> <p>The Corporation did not conduct operational planning consistently through the use of its planning tool, and was missing key planning information.</p>	
Performance monitoring and reporting	The Corporation monitored and reported on its operational results.	<p>Management monitored and reported on collection and research activities, and held regular meetings to discuss them.</p> <p>Management of each museum monitored its exhibitions and public programs, and held regular meetings to discuss them.</p> <p>Management of each museum regularly reported to the Corporation's management committee.</p>	
Legend—Assessment against the criteria  Met the criteria  Met the criteria, with improvement needed  Did not meet the criteria			

43. **Weakness—Operational planning.** The Corporation did not include key information in its operational plans. It had a software tool for developing operational plans for individual organizational units. We found that the tool had not been used consistently or in the way that it had been designed for.

44. The tool design provided a sound foundation for operational planning. It required users to detail specific tasks to be accomplished during the year, including their timing, and to identify necessary human and financial resources, and expected results. However, we found that the resulting operational plans that we examined varied in the type and breadth of content and did not contain all the required information. For example, they lacked detailed information on human resources required to complete identified tasks. Also, although users may have selected performance indicators in the software tool, we found that there were generally no associated targets in the resulting operational plans. We observed that the tool had been used largely for setting budgets and monitoring financial performance. We also found that some divisions used planning practices that were not part of the tool.

45. This weakness matters because, without all the necessary information in its operational plans, the Corporation might not properly identify and allocate the resources it needs to achieve its objectives.

46. **Recommendation.** The Corporation should ensure that its operational planning includes required information, such as clear identification of tasks to be performed, timing of their performance, employees responsible, required resources, and expected results.

***The Corporation's response.** Agreed. Management will ensure that operational planning is carried out more consistently across the organization, by ensuring that operational plans contain all the required information on tasks to be performed, their timeline for completion, the resources allocated, and the expected results. This strengthened operational planning is to be implemented in the 2019–20 fiscal year.*

Collection management

47. **Analysis.** We found several weaknesses in collection management that, taken together, amounted to a significant deficiency (Exhibit 7).

Exhibit 7 Collection management—key findings and assessment










Systems and practices	Criteria used	Key findings	Assessment against the criteria
Collection development	The Corporation developed a collection that promotes understanding of the transformation of Canadian life through science and technology.	<p>The Corporation had a Board-approved policy on development and management of its collection. It also had guidelines for acquisition, deaccession, and disposal of collection objects.</p> <p>The Corporation had a strategy for the development of the collection.</p> <p>The Corporation had updated guidelines for developing historical and collection assessments, which form the basis for the Corporation's collection development.</p> <p>For the objects we examined, the Corporation followed its process when permanently removing artifacts from the collection.</p> <p>Weaknesses</p> <p>The Corporation did not have plans to address its backlog of objects that it had acquired but not fully processed, to improve documentation of older artifacts, or to continue rationalizing its collection.</p> <p>The Corporation did not obtain required approvals for some of the objects it had acquired.</p>	
Legend—Assessment against the criteria <ul style="list-style-type: none">  Met the criteria  Met the criteria, with improvement needed  Did not meet the criteria 			

Exhibit 7 Collection management—key findings and assessment (continued)

Systems and practices	Criteria used	Key findings	Assessment against the criteria
Collection conservation	The Corporation maintained the physical, historical, and aesthetic integrity of its collection.	<p>The Corporation had a directive that governed the responsibilities, procedures, and processes of the Corporation's Conservation Services unit. It also had guidelines for conservation and operation of artifacts.</p> <p>The Corporation recently completed a comprehensive assessment of the risks affecting the collection.</p> <p>Weaknesses</p> <p>The Corporation did not have appropriate storage facilities to protect its collection from deterioration or damage.</p> <p>The Corporation did not approve treatment proposals before applying conservation treatments, in some instances.</p> <p>The Corporation lacked a rigorous process to control employees' access to warehouses.</p> <p>The Corporation's schedule for moving the collection was not based on the risk to objects.</p>	
Collection accessibility	The Corporation made its physical and virtual collections accessible to the public.	<p>The Corporation made part of its collection accessible through exhibitions and on its website.</p> <p>The Corporation had a directive on lending artifacts to other institutions and followed the approval process for the loans we examined.</p> <p>Weakness</p> <p>Because the Corporation had a backlog of uncatalogued objects, it could not determine how much of its collection was accessible.</p>	
<p>Legend—Assessment against the criteria</p> <p> Met the criteria</p> <p> Met the criteria, with improvement needed</p> <p> Did not meet the criteria</p>			

48. **Significant deficiency—Collection management.** The weaknesses that we found in the Corporation's collection development, conservation, and accessibility amounted to a significant deficiency because the collection of artifacts and materials was the Corporation's fundamental asset for achieving its mandate.

49. We found that the Corporation had no concrete plans for addressing its backlog of uncatalogued objects. The Corporation estimated that it had more than 1,000 lots, each consisting of one or more boxes of objects that had not been fully processed. Processing involves identifying objects and helping to determine their condition, potential conservation treatments, uses in future exhibitions, and detailed cataloguing. Processing also identifies candidates for disposal, reducing storage requirements. Management estimated that cataloguing just the tombstone information of the backlog objects would take several years of full-time effort by all cataloguers, who were also expected to perform other functions.

50. In 2007, the Corporation began a collection rationalization project, and has identified it as a key strategic initiative. The project's objective was to improve documentation of older artifacts, which could also lead to disposal of items no longer needed. However, we found that the Corporation did not have a plan for this project. Without a plan, some employees undertook project initiatives only when time permitted.

51. We also found that the Corporation did not follow some of its own collection development and conservation processes. For example, the Corporation's Acquisitions Committee had not approved 2 of the 11 acquisition lots we examined. Sound acquisition decisions are especially important, given the backlog challenges and lack of storage space. Additionally, for four of the nine artifacts we examined, the proposed conservation treatment was not approved before treatments took place. Improper treatments can affect the historical integrity of artifacts.

52. A significant part of the Corporation's collection was stored in warehouses outside its museums. We found that access to the collection warehouses had not been rigorously controlled; some employees whose jobs were not related to managing the collection had access to those facilities.

53. The storage facilities had been deemed inadequate for many years, for reasons that included poor environmental controls and insufficient space. At the time of our audit, the Corporation was in the process of detailed planning for the move to the Collections Conservation Centre. The move, which was part of the Corporation's solution for its storage issues, was planned to begin at the end of 2018 and continue over a few years. The Corporation had also identified many risks involved in the move, along with mitigating actions, some of which were in progress. However, the mitigating actions did not always indicate timing and necessary resources, where appropriate. We found that the current plan scheduled the movement of objects on the basis of the size of the objects and when the leases of current warehouse facilities would expire—rather than on a risk assessment of deterioration, damage, or theft.

54. This significant deficiency matters because, until the backlog of objects is properly assessed, unprocessed objects are at risk of losing their integrity, are not accessible to the public, and take up much-needed space. Also, the Corporation's acquisition and conservation requirements contribute to sound management of its collection. Finally, until the move to the Collections Conservation Centre is complete and access control is strengthened, the portion of the Corporation's collection that remains in warehouses will continue to face risks of deterioration, damage, or theft.

55. **Recommendation.** The Corporation should develop detailed plans for the remaining work on processing and documenting its collection, and incorporate risk to the collection into its detailed move plan.

***The Corporation's response.** Agreed. Collection rationalization has become an integrated program of curatorial and collection management activities at the Corporation. In the spring of 2018, the Corporation's management identified collection rationalization priorities in order to assess a large volume of objects prior to their move to the new Collections Conservation Centre. The detailed collection move plan, which will be completed by the 2019–20 fiscal year, will include collection risk considerations.*

56. **Recommendation.** The Corporation should monitor whether key requirements for establishing, maintaining, and developing its collection are being followed.

***The Corporation's response.** Agreed. The Corporation's management has initiated a review of the collection development, conservation, and management practices. Over the 2019–20 fiscal year, management will strengthen its monitoring system, to ensure that corporate policies and procedures are being followed.*






57. **Recommendation.** The Corporation should properly limit who can access the collection.

***The Corporation's response.** Agreed. The Corporation's management will appropriately control access; a review of card access has been completed to limit access to those working directly with the collection. In addition, new procedures will be put in place coinciding with the move into the Collections Conservation Centre, a purpose-built facility that will offer even stricter security controls.*

Exhibition and public program management

58. **Analysis.** We found that the Corporation had weaknesses in both the development and presentation of exhibitions, and in the development and delivery of public programs (Exhibit 8).

Exhibit 8 Exhibition and public program management—key findings and assessment

Systems and practices	Criteria used	Key findings	Assessment against the criteria
Exhibition development and presentation	The Corporation presented exhibits that promoted understanding of the transformation of Canadian life through science and technology.	<p>The Corporation delivered exhibitions in its three museums.</p> <p>The Corporation had a Board-approved policy on exhibitions.</p> <p>The Corporation conducted research to determine the public's knowledge, questions, and concerns about proposed topics before initiating development of the exhibitions we examined.</p> <p>Weakness</p> <p>The Corporation did not define or follow some of its policy and procedural requirements.</p>	
Public program development and delivery	The Corporation delivered public programs that promoted understanding of the transformation of Canadian life through science and technology.	<p>The Corporation delivered public programs in its three museums.</p> <p>The Corporation had a Board-approved policy on public programs.</p> <p>Weakness</p> <p>The Corporation did not follow some aspects of its policy and did not have guidelines to help implement the policy.</p>	
<p>Legend—Assessment against the criteria</p> <p> Met the criteria</p> <p> Met the criteria, with improvement needed</p> <p> Did not meet the criteria</p>			

59. **Weaknesses—Exhibition and public program management.** We found that some of the requirements in the Corporation's policy on exhibitions and its policy on public programs were not defined, while others were not explicitly considered by management and employees when making decisions. For example, both policies included a requirement to follow the highest possible museological standards of excellence, but those standards had not been defined. So, it was not possible to monitor whether this policy requirement was being met. As another example, for the exhibitions we examined, it was not evident that the Corporation had considered a policy requirement that it try to showcase its own content within exhibitions borrowed from other museums.

60. We also found that the Corporation lacked guidelines for public programs and did not have specific and current ones for exhibitions. For example, the exhibition guidelines stated that curators were responsible for ensuring the accuracy and intellectual integrity of all aspects of an exhibition, but did not specify how this was to be done, including how to document their practices. Because the documentation varied, and some curators did not document their processes at all, we found that the Corporation could not demonstrate what had been done to meet this responsibility.

61. The policy on exhibitions had a related guideline that set out the process for the development of exhibitions. Though that process was supposed to be reviewed every two years, we found that it dated back to 1998. We also found that the guideline document was not being used; therefore, some requirements were not consistently performed. One such requirement was to evaluate sections of the exhibitions (such as texts, graphic presentations, and interactive components) while the exhibitions were being designed. The importance of evaluation during exhibition development was one of the lessons learned from a recent large exhibition that the Corporation did not consider a success.

62. These weaknesses matter because policies and related guidelines are an important part of a corporate control framework that identifies corporate expectations for developing, presenting, and delivering exhibitions and public programs, and can contribute to more efficient and effective use of resources.

63. **Recommendation.** The Corporation should re-evaluate its recently updated policy on exhibitions and policy on public programs, develop or update related guidelines where appropriate, and monitor that key requirements are being followed.

The Corporation's response. Agreed. Building on its successes with the renewal of the Canada Science and Technology Museum, with its digital content and expanding global reach, and the new opportunities arising from the addition of temporary exhibit spaces both there and at the Canada Aviation and Space Museum, the Corporation will redevelop its exhibition and program policies. In addition, the guidelines will be revised to support implementation of the policies. The policy and guideline work for exhibitions will be completed in the 2019–20 fiscal year. The policy and guideline work for public programs will be completed in 2020–21.

Conclusion

64. In our opinion, based on the criteria established, there was a significant deficiency in the National Museum of Science and Technology's collection management, but there was reasonable assurance there were no significant deficiencies in the other systems and practices that we examined. We concluded that, except for this significant deficiency, the Corporation maintained its systems and practices during the period covered by the audit in a manner that provided the reasonable assurance required under section 138 of the *Financial Administration Act*.

About the Audit

This independent assurance report was prepared by the Office of the Auditor General of Canada on the National Museum of Science and Technology. Our responsibility was to express

- an opinion on whether there is reasonable assurance that during the period covered by the audit, there were no significant deficiencies in the Corporation's systems and practices that we selected for examination; and
- a conclusion about whether the Corporation complied in all significant respects with the applicable criteria.

Under section 131 of the *Financial Administration Act* (FAA), the National Museum of Science and Technology is required to maintain financial and management control and information systems and management practices that provide reasonable assurance that

- its assets are safeguarded and controlled;
- its financial, human, and physical resources are managed economically and efficiently; and
- its operations are carried out effectively.

In addition, section 138 of the FAA requires the Corporation to have a special examination of these systems and practices carried out at least once every 10 years.

All work in this audit was performed to a reasonable level of assurance in accordance with the Canadian Standard for Assurance Engagements (CSAE) 3001—Direct Engagements set out by the Chartered Professional Accountants of Canada (CPA Canada) in the CPA Canada Handbook—Assurance.

The Office applies Canadian Standard on Quality Control 1 and, accordingly, maintains a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

In conducting the audit work, we have complied with the independence and other ethical requirements of the relevant rules of professional conduct applicable to the practice of public accounting in Canada, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality, and professional behaviour.

In accordance with our regular audit process, we obtained the following from the Corporation's management:

- confirmation of management's responsibility for the subject under audit;
- acknowledgement of the suitability of the criteria used in the audit;
- confirmation that all known information that has been requested, or that could affect the findings or audit conclusion, has been provided; and
- confirmation that the audit report is factually accurate.

Audit objective

The objective of this audit was to determine whether the systems and practices we selected for examination at the National Museum of Science and Technology were providing it with reasonable assurance that its assets were safeguarded and controlled, its resources were managed economically and efficiently, and its operations were carried out effectively as required by section 138 of the *Financial Administration Act*.

Scope and approach

Our audit work examined the National Museum of Science and Technology. The scope of the special examination was based on our assessment of the risks the Corporation faced that could affect its ability to meet the requirements set out by the *Financial Administration Act*.

In performing our work, we reviewed key documents related to the systems and practices selected for examination. We interviewed Board trustees, senior management, and other employees of the Corporation. We tested the systems and practices in place to obtain the required level of audit assurance. Where testing was performed, samples were sufficient in size to assess whether the error rates in the population were no greater than 10%, with a confidence level of 90%.

The systems and practices selected for examination for each area of the audit are found in the exhibits throughout the report.

In carrying out the special examination, we did not rely on any internal audits.

Sources of criteria

The criteria used to assess the systems and practices selected for examination are found in the exhibits throughout the report.

Corporate governance

Meeting the Expectations of Canadians: Review of the Governance Framework for Canada's Crown Corporations, Treasury Board Secretariat, 2005

Internal Control—Integrated Framework, Committee of Sponsoring Organizations of the Treadway Commission, 2013

Corporate Governance in Crown Corporations and Other Public Enterprises—Guidelines, Department of Finance and Treasury Board, 1996

20 Questions Directors Should Ask about Risk, Canadian Institute of Chartered Accountants, 2006

Performance Management Program for Chief Executive Officers of Crown Corporations—Guidelines, Privy Council Office, 2016

Practice Guide: Assessing Organizational Governance in the Public Sector, The Institute of Internal Auditors, 2014

Strategic planning

20 Questions Directors Should Ask about Risk, Canadian Institute of Chartered Accountants, 2006

Meeting the Expectations of Canadians: Review of the Governance Framework for Canada's Crown Corporations, Treasury Board Secretariat, 2005

Guidelines for the Preparation of Corporate Plans, Treasury Board Secretariat, 1996

Corporate Governance in Crown Corporations and Other Public Enterprises—Guidelines, Department of Finance and Treasury Board, 1996

Recommended Practice Guideline 3, Reporting Service Performance Information, International Public Sector Accounting Standards Board, 2015

Corporate risk management

20 Questions Directors Should Ask about Risk, Canadian Institute of Chartered Accountants, 2006

Internal Control—Integrated Framework, Committee of Sponsoring Organizations of the Treadway Commission, 2013

Corporate Governance in Crown Corporations and Other Public Enterprises—Guidelines, Department of Finance and Treasury Board, 1996

Operational planning and reporting

Guidelines for the Preparation of Corporate Plans, Treasury Board Secretariat, 1996

A Guide to the Project Management Body of Knowledge (PMBOK® Guide), fourth edition, Project Management Institute Inc., 2008

COBIT 5 Framework—APO05 (Manage Portfolio), BAI01 (Manage Programmes and Projects), ISACA

Plan-Do-Check-Act management model adapted from the Deming Cycle

Internal Control—Integrated Framework, Committee of Sponsoring Organizations of the Treadway Commission, 2013

Collection management

Corporate Plan 2017–2018 to 2021–2022, National Museum of Science and Technology

Corporate Policy on Collection Development and Management (Policy #100), Canada Science and Technology Museums Corporation, 2017

Guideline for Acquisition and Incoming Loans, Canada Science and Technology Museums Corporation, 2017

Guideline for Deaccessioning and Disposition of Collection Objects, Canada Science and Technology Museums Corporation, 2017

Guideline on Conservation and Operation of Artifacts, Canada Science and Technology Museums Corporation, 2015

Directive on Conservation Management Plan, Canada Science and Technology Museums Corporation, 2015

Museums Act

Exhibition and public program management

Corporate Plan 2017–2018 to 2021–2022, National Museum of Science and Technology

Corporate Policy on Exhibitions (Policy #1000), Canada Science and Technology Museums Corporation, 2015

Corporate Policy on Public Programmes (Policy #200), Canada Science and Technology Museums Corporation, 2016

Museums Act

Period covered by the audit

The special examination covered the period between 1 December 2017 and 30 April 2018. This is the period to which the audit conclusion applies. However, to gain a more complete understanding of the significant systems and practices, we also examined certain matters that preceded the starting date of this period.

Date of the report

We obtained sufficient and appropriate audit evidence on which to base our conclusion on 19 November 2018, in Ottawa, Canada.

Audit team

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List of Recommendations

The following table lists the recommendations and responses found in this report. The paragraph number preceding the recommendation indicates the location of the recommendation in the report, and the numbers in parentheses indicate the location of the related discussion.

Recommendation	Response
Corporate management practices	
22. The Corporation's management should work with the Board to identify key information that it should provide to the Board for effective oversight of its collection management and key legal, regulatory, and policy requirements. The Board should also monitor the Corporation's compliance with those requirements. (18–21)	The Corporation's response. Agreed. Over the 2018–19 fiscal year, management will work with the Board of Trustees, to identify key information that will enable strengthened monitoring and reporting on collection management and on compliance with legislation, regulations, and policies.
25. The Corporation should continue to engage with the Minister of Canadian Heritage for the appointment of a Chairperson and Vice-Chairperson of the Board with the necessary skills and experience, as identified by the Corporation. (23–24)	The Corporation's response. Agreed. Management will continue to work with the Minister of Canadian Heritage toward the appointment of a Chairperson and Vice-Chairperson of the Board with the necessary skills and experience as identified through the Board skills matrix, and its assessment of any gaps in skills and experience on the Board.
30. The Corporation should reassess its performance indicators and targets to enable it to measure progress toward resolving collection management challenges and more meaningfully assess achievement of its strategic objective of having a best-in-class collection. (27–29)	The Corporation's response. Agreed. Management will review the performance indicators for its strategic objective of having a best-in-class collection, as part of developing a new performance measurement framework over the 2019–20 fiscal year. This framework will align with the next five-year strategic plan (2020–2025).
35. The Corporation should establish risk tolerance levels and manage its risks with action plans that are specific, time-bound, and measurable. The Corporation should then monitor how the risks are managed. (32–34)	The Corporation's response. Agreed. Over the 2019–20 fiscal year, the Corporation will continue to develop and implement the integrated risk management framework, including defined risk tolerances and measurable action plans, to enable proactive risk management practices.
Management of operations	
46. The Corporation should ensure that its operational planning includes required information, such as clear identification of tasks to be performed, timing of their performance, employees responsible, required resources, and expected results. (43–45)	The Corporation's response. Agreed. Management will ensure that operational planning is carried out more consistently across the organization, by ensuring that operational plans contain all the required information on tasks to be performed, their timeline for completion, the resources allocated, and the expected results. This strengthened operational planning is to be implemented in the 2019–20 fiscal year.

Recommendation	Response
<p>55. The Corporation should develop detailed plans for the remaining work on processing and documenting its collection, and incorporate risk to the collection into its detailed move plan. (49, 50, 53, and 54)</p>	<p>The Corporation's response. Agreed. Collection rationalization has become an integrated program of curatorial and collection management activities at the Corporation. In the spring of 2018, the Corporation's management identified collection rationalization priorities in order to assess a large volume of objects prior to their move to the new Collections Conservation Centre. The detailed collection move plan, which will be completed by the 2019–20 fiscal year, will include collection risk considerations.</p>
<p>56. The Corporation should monitor whether key requirements for establishing, maintaining, and developing its collection are being followed. (51 and 54)</p>	<p>The Corporation's response. Agreed. The Corporation's management has initiated a review of the collection development, conservation, and management practices. Over the 2019–20 fiscal year, management will strengthen its monitoring system, to ensure that corporate policies and procedures are being followed.</p>
<p>57. The Corporation should properly limit who can access the collection. (52 and 54)</p>	<p>The Corporation's response. Agreed. The Corporation's management will appropriately control access; a review of card access has been completed to limit access to those working directly with the collection. In addition, new procedures will be put in place coinciding with the move into the Collections Conservation Centre, a purpose-built facility that will offer even stricter security controls.</p>
<p>63. The Corporation should re-evaluate its recently updated policy on exhibitions and policy on public programs, develop or update related guidelines where appropriate, and monitor that key requirements are being followed. (59–62)</p>	<p>The Corporation's response. Agreed. Building on its successes with the renewal of the Canada Science and Technology Museum, with its digital content and expanding global reach, and the new opportunities arising from the addition of temporary exhibit spaces both there and at the Canada Aviation and Space Museum, the Corporation will redevelop its exhibition and program policies. In addition, the guidelines will be revised to support implementation of the policies. The policy and guideline work for exhibitions will be completed in the 2019–20 fiscal year. The policy and guideline work for public programs will be completed in 2020–21.</p>

