Canada's Nuclear Regulator

Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2022






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Cover images
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CNSC staff taking dose rate readings around a fixed gauge (Image source: CNSC)
Medical linear accelerator for treating cancer patients (Image source: CNSC)
Portable gauge in use by a licensee during an inspection (Image source: CNSC)
Inspection of a veterinary nuclear medicine licensee, showing a bone scan of a horse (Image source: CNSC)
CNSC staff presenting on the CNSC's role in regulating the safe transport of radioactive material (Image source: CNSC)
A hot cell used for handling unsealed nuclear substances produced by a cyclotron (Image source: CNSC)

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Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2022

Executive summary

The *Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2022* provides information on the use of nuclear substances in the medical, industrial, academic and research, and commercial sectors. Licensees covered by this report are located across Canada, and Canadian Nuclear Safety Commission (CNSC) staff acknowledge all relevant treaties and all traditional territories on which the licensees are situated. Most of these licensees are regulated by the CNSC's Directorate of Nuclear Substance Regulation (DNSR). The regulatory oversight report (ROR) also includes selected waste nuclear substance licensees that are not reported on in other RORs and that are regulated by the Directorate of Nuclear Cycle and Facilities Regulation.

The report on licensee performance for the 2 high-energy research particle accelerators, which was last incorporated into the 2019 nuclear substances ROR presented in 2020, is on a 3-year reporting cycle and would have been included in this ROR. However, these facilities and their performance reporting are more like that of other major CNSC-regulated facilities in Canada and will therefore be reported on in the Research Reactors and Particle Accelerator Facilities ROR in 2024, which are also on a 3-year reporting cycle. These 2 licensees did have full Commission licensing hearings, with interventions, in 2022.

Based on their assessment of licensee performance results for 2022, CNSC staff continue to conclude that nuclear substances in Canada are used safely. This conclusion is based on an analysis of the indicators covered in this report – inspection compliance ratings, enforcement actions, doses to workers, and event reports. In response to questions from the Commission in 2022 on the compliance ratings indicator, this year's report provides additional context on how CNSC staff interpret those ratings. Staff have included new sections on the role that licensing activities play in assessing compliance and on how they calculate inspection ratings, to shed light on why there can appear to be downward trends in compliance when there are no actual performance issues within a sector or subsector. Staff have moved away from comparing in-year compliance data to the ratings from the previous year, and instead are comparing in-year compliance data against the 5-year averages of compliance results. This approach takes into account the fact that different licensees are inspected every year and provides a clearer view of performance trending. Lastly, CNSC staff have further explained the "unacceptable" versus "below expectations" ratings in order to distinguish between risks to health and safety requiring immediate action and overall performance trends requiring longer-term regulatory strategies.

In addition to the detailed explanation of performance ratings for the sectors in general, staff have also included an analysis of the radiation protection safety and control area within the nuclear medicine subsector. Licensee performance in this subsector has been of interest to the Commission and intervenors, and the analysis more clearly communicates the sources of non-compliance and the CNSC's regulatory response.

Responsiveness and transparency are key elements of the CNSC's commitment to building trust in the nuclear regulator. In addition to the changes to the ROR described above, prompted by Commission and intervenor feedback, CNSC staff contacted all intervenors on the 2021 ROR individually to respond to their comments directly and in more detail than was provided during the Commission proceeding in November 2022.

Based on the CNSC's regulatory oversight, the evaluations presented in this report confirm the following:

- The use of nuclear substances and prescribed equipment in Canada remains safe and secure. "Unacceptable" ratings were issued in only 0.6% of inspections, and the associated non-compliances were corrected in a timely manner.
- Doses to workers remain low. No nuclear energy workers (NEWs) exceeded the regulatory dose limits, and less than 0.01% of non-NEWs reported doses greater than the regulatory limit of 1 mSv/year.
- Escalated enforcement actions are used when deemed necessary to ensure safety and security. Only 0.6% of inspections resulted in the issuance of an order.
- Events are reported, and corrective actions are implemented when required. More than 98% of reported events were considered to be of no safety significance based on the International Nuclear and Radiological Event Scale; no events were rated at higher than 1 on that scale.
- Engagement and outreach with industry, the public and other stakeholders are key to openness and transparency.

Overall, licensees made adequate provisions to protect health, safety, security and the environment with respect to the use of nuclear substances and prescribed equipment, and took the measures required to implement Canada's international obligations and commitments.

Use of nuclear substances in Canada: 2022

The *Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2022* summarizes the safety performance of 1,479 licensees holding a total of 2,080 licences. The Canadian Nuclear Safety Commission (CNSC) authorizes licensees to use nuclear substances and prescribed equipment in the medical, industrial, academic and research, and commercial sectors. For a description of the licensed activities covered in this report, refer to appendix A. Additional data on licensees covered by this ROR is available in appendix B.

CNSC staff use many metrics to evaluate licensees' safety and security performance. This ROR uses a subset of those metrics, which, when taken together, provide a well-rounded picture of the performance of licensees. The metrics used in this report are:

- compliance performance
- enforcement actions
- doses to workers
- reportable events

In addition to the standard review of performance indicators, the 2022 ROR also includes an overview of the licensing process and information related to safeguards and other international commitments. The 2022 ROR also provides an update on the situation at Mississauga Metals & Alloys Inc. Lastly, the report provides the Commission with information about stakeholder engagement, which is a critical element of the CNSC's regulatory approach.

This ROR includes data in both the body and appendices. The main body of the report provides a high-level overview of the CNSC's regulatory efforts and the licensees' performance, while the detailed data to support this overview is found in the appendices.

1.0 Licensing overview

This section provides an overview of the licensing process as it applies to licences covered by this report and is meant to highlight the importance of licensing as a foundational piece of compliance oversight. Licensing oversight plays a key role in supporting licensee performance, and high-quality assessments help ensure that licensees have strong programs in place.

The *Nuclear Safety and Control Act* (NSCA) authorizes the CNSC to issue licences to applicants who, in the opinion of the CNSC:

- are qualified to undertake the proposed licensed activity
- will make adequate provisions for the health and safety of persons, the protection of the environment and the maintenance of national security
- will take the measures necessary to implement international obligations to which Canada has agreed

The *General Nuclear Safety and Control Regulations*, the *Nuclear Substances and Radiation Devices Regulations* and the *Class II Nuclear Facilities and Prescribed Equipment Regulations* lay out requirements for licence applications. The CNSC's REGDOC-1.6.1, *Licence Application Guide: Nuclear Substances and Radiation Devices*, provides guidance to prospective and current licensees on how to complete and submit an application for a CNSC licence for nuclear substances and radiation devices in accordance with the NSCA and the regulations made under it. REGDOC-1.4.1, *Licence Application Guide: Class II Nuclear Facilities and Prescribed Equipment*, identifies the information to be provided in support of an application for a licence to:

- construct, operate or decommission a Class II nuclear facility
- operate Class II prescribed equipment not installed in a facility
- service Class II prescribed equipment
- possess, use, store, transfer, import or export a nuclear substance used in manual brachytherapy, incorporated in Class II prescribed equipment, or otherwise associated with the licensed activity

While there is no specific licence application guide for waste nuclear substances, applicants must comply with the application requirements as laid out in the regulations.

The CNSC licensing process starts with an applicant's submission for a new licence or for an amendment, renewal or revocation of a current licence. CNSC staff assess the application for such things as completeness and the adequacy of radiation safety and training manuals.

CNSC staff perform risk-informed technical assessments of applications submitted to the CNSC to ensure that the applicant is capable of and committed to complying with NSCA requirements, as well as the requirement to maintain an effective radiation safety program in accordance with the *Radiation Protection Regulations*. The licence application guides, created to ensure that expectations for applicants are clear and to facilitate applicants' interactions with the CNSC, assist applicants in providing the information needed by the CNSC to make this determination. The level of information that must be submitted and the expected complexity of the radiation protection program when applying for a licence are commensurate with the risk of the licensed activity.

For licence renewals, licensees are requested to submit the renewal application a minimum of 2 months prior to the expiry of the existing licence. Renewal applications may refer to information previously submitted to the CNSC if the information has not changed. The level of technical assessment required by staff varies depending on the new information provided by the licensee. The option of referencing previously submitted information reduces the burden on both the licensee and CNSC staff and ensures that licence renewals can be issued in a timely manner. In addition to reviewing the submitted application, CNSC staff review compliance information such as inspection results, reported events and annual compliance reports before making a licensing decision. In the event of poor compliance history, while a licence may still be issued, the authorized activities could be limited or the licence period could be shortened.

During the licence period, there may be circumstances that require a change to the licence. The information required to amend a licence will vary depending on the change. Each amendment request is reviewed with the same risk-informed lens as any application. Amendments may be required for a variety of circumstances, including changes to the regulatory program, the licensed activities, the nuclear substances or prescribed equipment authorized by the licence, or the licensed locations. Administrative changes, such as a change in company name, also require an amendment to the licence.

Designated officers (DOs) are staff members in specific positions who are authorized by the Commission to carry out specific duties under section 37 of the NSCA. Given the large number of licences in this group and the relatively low risk to the public, the Commission has authorized DOs to make decisions related to the licensees covered in this report, including issuing, renewing and amending licences. If an application satisfies all CNSC requirements, a DO authorized by the Commission may issue a licence authorizing the licensee to conduct the activities requested in the application. The licence includes provisions that define and limit the scope of the authorized activities, as well as specific conditions that must be fulfilled by the licensee when conducting those activities. As per the licence conditions, licensees must inform the CNSC of any changes to their approved programs. Additional information about designated officer decisions can be found in appendix B.1.

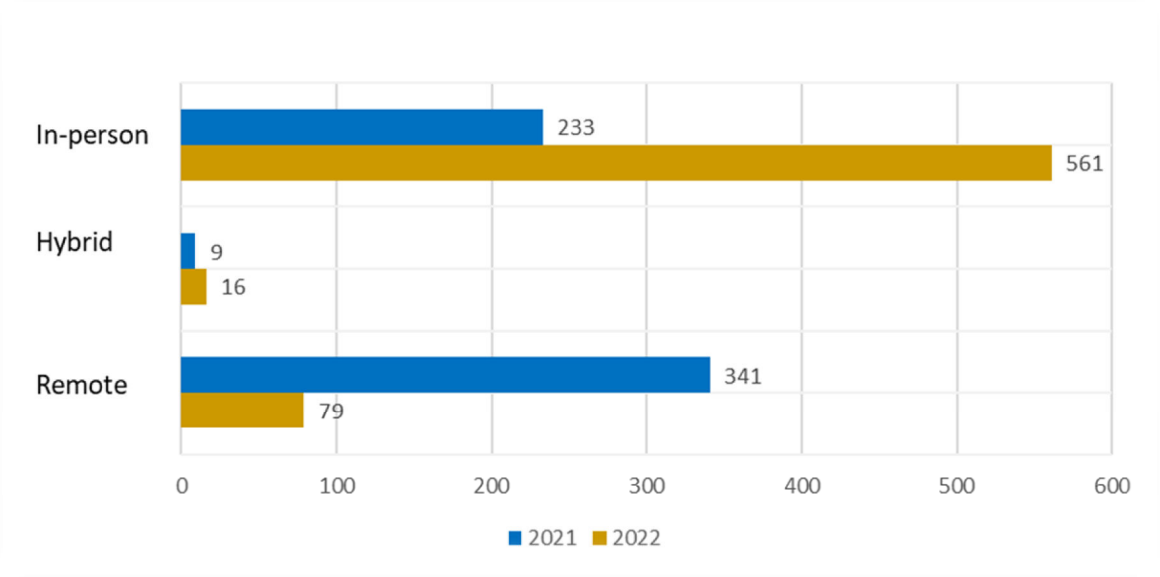
Rigorous assessments of licensee programs, along with timely desktop reviews of annual reports and changes submitted by the licensee, are critical in ensuring that licensees have appropriate programs and people in place for the safe and secure use of nuclear substances in Canada.

2.0 Inspection overview in 2022

With COVID-19 still impacting inspections in the early part of the year due to the presence of the Omicron variant, the CNSC continued to balance regulatory oversight with the health and safety of CNSC and licensee staff. Inspections in 2022 included a mix of remote, in-person and hybrid inspections.

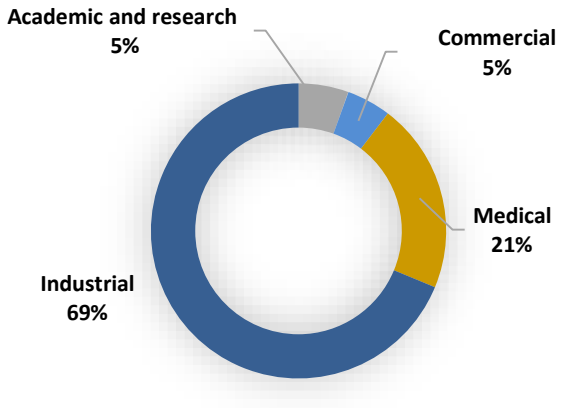
In 2022, staff performed 656 inspections (561 in-person, 16 hybrid and 79 remote). Figure 1 shows the transition in the types of inspections performed from 2021 to 2022, with the number of in-person inspections increasing and the number of remote inspections decreasing. Staff see this as a positive trend; while remote inspections are a useful tool, CNSC staff believe that, in most cases, onsite inspections are the preferred option.

Figure 1: Comparison of the types of inspections performed in 2021 and 2022



Most of the inspections (90%) were conducted in the industrial and medical sectors, as shown in figure 2. This is to be expected, as these 2 sectors make up approximately 79% of all licences.

Figure 2: Percentage inspections by sector in 2022



The inspection planning process used by CNSC staff takes a risk-informed approach that prioritizes the most critical inspections by applying a baseline inspection frequency and taking into account other factors, such as declining performance. This process was described in detail in section 2.0 of the 2021 ROR.

In 2022, staff prioritized inspections of medium-risk licensed activities that were overdue for their baseline inspections over higher risk licensed activities that had been inspected more recently, in a deliberate, risk-informed decision that made the most effective and efficient use of resources without compromising safety.

The number of inspections increased in 2022 compared to 2021, and staff were able to complete approximately 86% of the planned inspections (656 of 762). It should be noted, however, that most of the high-priority inspections (90%) were completed as planned. Inspections were not completed or were deferred for a number of reasons, including:

- the impact of performing remote inspections, especially in the early part of the year (e.g., certain types of inspections, such as field inspections, do not lend themselves well to remote inspections)
- staffing level fluctuations and onboarding of new inspectors
- licensees not operating at the time of the planned inspection
- licensees not having nuclear substances or radiation devices in their possession at the time of the planned inspection
- issues in transmitting classified information for planned remote security inspections

CNSC staff continued to address the inspection backlog caused by pandemic restrictions and continued to increase the number of annual inspections to regain the baseline inspection frequency determined by the CNSC's risk-informed compliance program. Primary responsibility for safety lies with the licensee; therefore, the CNSC expects licensees to comply with regulatory requirements whether they are subject to a CNSC inspection or not. Nonetheless, inspections are an important component of regulatory oversight that allow the CNSC to verify licensee compliance with those requirements. Moreover, they provide an opportunity for inspectors to intervene early with licensees when performance starts to decline. As the number of inspections increases, staff presence at licensee sites will be a reminder to licensees that regulatory oversight and compliance with regulatory requirements continue to be priorities for the CNSC. In the meantime, the risk-informed planning process allows CNSC staff to maintain assurance that the nuclear substances sector continues to be safe despite the lower number of inspections.

While inspections are important, they are not the only regulatory oversight tool available to the CNSC to assess licensee compliance. Throughout 2022, CNSC staff also reviewed over 1,400 annual compliance reports submitted by licensees and followed up on more than 160 reported events. Both activities can provide indicators of licensee performance to supplement inspection findings. In addition, licensee programs are reviewed and evaluated as part of licence assessments, as described in section 1.0 of this report.

Considering the full suite of compliance activities, as well as the ability to prioritize the most risk-significant inspections, CNSC staff have concluded that the impact on licensee performance from the continued reduced number of inspections in 2022 remains acceptable.

3.0 Compliance overview

Appendix C covers the full 2022 performance data, broken down by safety and control area, sector and subsector. In addition, the data shows the 5-year performance trends within each of these categories.

Overview of the compliance framework

To measure licensee performance, CNSC staff use the well-established Safety and Control Area Framework. The framework includes 14 safety and control areas (SCAs) covering all technical areas of regulatory oversight. During licensing and compliance activities, CNSC staff evaluate the licensee's performance within each relevant SCA by reviewing licensee documents and conducting inspections. Owing to the broad nature of the different activities conducted by the licensees covered, not all SCAs apply to all activities or all licensees. CNSC staff acknowledge that all SCAs are important; however, the ROR focuses on those that are most effective in providing an overall indication of the safety performance of the licensees, namely, the management system, operating performance, radiation protection, and security SCAs. Performance data in the environmental protection and the conventional health and safety SCAs is also provided for the waste nuclear substance licensees. These licensees, unlike other licensees covered by this report, have a higher potential for environmental releases and, given the nature of the work performed, there is a potentially higher risk in conventional health and safety.

All relevant SCAs are assessed during inspections, and individual SCAs normally include multiple assessment areas. The areas or items to be assessed arise from regulatory requirements, licence conditions, and documents referenced in the licence. Compliance ratings for each SCA are calculated at the end of each inspection or, in the case of waste nuclear substance licences, on an annual basis.

A description of the ratings is provided in appendix J.

Overall analysis of 2022 compliance results

A total of 4 unacceptable ratings, as defined by the CNSC, were issued in 2022. All 4 unacceptable ratings were issued in the radiation protection SCA to 2 industrial sector licensees. Three of the unacceptable ratings were issued to a single portable gauge licensee and the fourth was issued to a fixed gauge licensee. Orders were issued to both licensees in response to these unacceptable ratings. In both cases, the licensees corrected all items of non-compliance and demonstrated that an effective radiation safety program had been implemented to the satisfaction of the CNSC before the order was closed. Additional information on these unacceptable ratings can be found in section 3.3. No unacceptable ratings were issued in the SCAs not covered in this report.

A list of inspections performed in 2022 is available in appendix H. Where items of non-compliance were identified, CNSC staff verified that licensees took appropriate corrective actions. Licensees promptly addressed any items of non-compliance that had immediate risks to health, safety or security.

Overall licensee performance has remained relatively stable over the past 5 years in all SCAs covered by this report. At the subsector level, there is more variation: some areas continue to see lower or declining performance, while others show improving performance. A brief overview of the SCAs is provided starting in section 3.1, with more details provided in appendix C. Appendix D presents the inspection results by subsector, offering another perspective on licensee performance in 2022.

Before discussing compliance performance trends in greater detail, and in response to feedback received from the Commission on the 2021 ROR, the following section has been added to provide more context to assist in interpreting performance data.

Calculating an SCA rating

When considering the performance data summarized in this report, it is important to understand how an SCA rating is reached. Individual SCAs include multiple assessment areas; the areas or items to be assessed arise from regulatory requirements, licence conditions, and documents referenced in the licence. Each area or item being assessed is assigned a risk ranking. Some of the requirements are administrative in nature and are considered relatively low risk, while others are linked to a potentially higher risk to health, safety or security. Note that when an inspection finds that an immediate risk exists, the licensee must address the issue right away.

All areas assessed within a given SCA impact the overall rating of that SCA. Non-compliances identified in relation to a higher risk requirement have more impact on the overall SCA rating than non-compliances identified in relation to a low-risk requirement. In fact, a single high-risk requirement that receives a below expectation rating will drop the overall performance in that SCA to below expectations. Examples of high-risk items from the SCAs covered in this report include thyroid monitoring requirements, calibration of survey meters, ascertainment and recording of doses, worker obligations, and the use of equipment and procedures. This conservative approach to rating licensee performance impacts the overall trends at the sector and subsector level.

Furthermore, this effect can be amplified during inspections of licensees who have larger numbers of workers and/or additional requirements placed on them due to the nature of the licensed activities performed. For example, while 9 out of 10 staff may have performed their thyroid monitoring at appropriate intervals over the period between inspections, if one worker missed one measurement in this period, they are deemed to be non-compliant and, because this is a high-risk line item, the entire SCA is rated as being below expectations. This does not necessarily point to a failure in the licensee's programs or indicate unsafe work practices.

Additional considerations

When interpreting compliance performance data, it is also important to bear in mind that the data reported in the ROR reflects the licensee's performance at the time of inspection and does not capture the effect of subsequent compliance activities. In reality, following an inspection that has yielded any below expectations ratings, CNSC staff track and follow up on all required corrective actions to ensure that all items of non-compliance have been addressed to their satisfaction (in other words, to ensure that the licensee has returned to a satisfactory rating). However, the improvements in performance will not be reflected in the ROR until that licensee is next inspected. This is why it is more meaningful to look at performance trends over a 5-year span, rather than the in-year or year-over-year performance results.

Lastly, in the context of safety significance, when reviewing the compliance data, the metric of primary relevance is the number of unacceptable ratings. In contrast to a below expectations rating, staff will issue unacceptable ratings in cases where licensee actions are unsafe. These situations are addressed immediately, typically through the issuance of an order, which is not closed until the CNSC is satisfied

with the licensee's corrective actions. As noted above, in 2022, only 4 unacceptable ratings were issued across all SCAs.

3.1 Management system

The management system SCA covers the framework that establishes the processes and programs required to ensure that an organization achieves its safety objectives, continuously monitors its performance against those objectives, and fosters a healthy safety culture.

In 2022, all sectors performed well in this SCA, with 98% of inspections receiving satisfactory ratings. This is comparable to the 5-year average of 97%. There were no unacceptable ratings in this SCA.

Refer to appendix C.1 and appendix D for additional information.

3.2 Operating performance

The operating performance SCA refers to the licensee's ability to perform licensed activities in accordance with pertinent operational and safety requirements defined in the NSCA, in its associated regulations, and in the licence conditions. Licensees are expected to demonstrate that they comply with operational and safety requirements by providing workers with appropriate procedures for the safe use of nuclear substances and prescribed equipment, by ensuring that workers follow procedures, and by maintaining records that demonstrate compliance.

In 2022, overall licensee performance in this SCA remained stable, with 85% of inspections yielding satisfactory ratings, which is the same as the 5-year average. While the industrial sector showed stable performance overall compared to the 5-year average for the sector, the fixed gauge subsector demonstrated continued low performance in this area, as seen in table 9. As a reminder to licensees in this subsector, in early 2023, as part of a wider DNSR Digest article that discussed the most common non-compliances by sector, staff re-shared a detailed checklist on vessel entry, since this is one of the areas of continuing non-compliance for licensees in the fixed gauge subsector. In 2022, the DNSR Digest was also used to circulate information on preparing for inspections for all licensees. Staff continue to employ graduated enforcement tools to attempt to improve licensee performance in this area.

There were no unacceptable ratings in this SCA.

Refer to appendix C.2 and appendix D for additional information.

3.3 Radiation protection

Every licensee is required to put in place a radiation protection program to ensure that contamination levels and radiation doses received by workers are monitored, controlled, maintained below regulatory dose limits, and kept at levels that are as low as reasonably achievable (ALARA), with social and economic factors being taken into account. Licensees are expected to monitor worker doses; post radiation warning signs; plan appropriately for radiological emergencies; manage oversight of operational activities; institute effective workplace practices that emphasize the use of time, distance and shielding to minimize exposure to radiation; and use appropriate protective equipment.

Overall, there has been a decrease in the number of licensees receiving satisfactory ratings in the radiation protection SCA. In 2022, 77% of those inspected received satisfactory ratings compared to 81% averaged over the last 5 years. While the academic and research sector and the commercial sector remained stable compared to the 5-year average, both the medical sector and the industrial sector showed declining performance. In the medical sector, 68% of inspected licensees achieved satisfactory ratings in this SCA

in 2022 compared to 75% averaged over the last 5 years. In particular, in the nuclear medicine subsector, only 63% of the 91 inspections performed resulted in satisfactory ratings. In the industrial sector, 77% of inspections resulted in satisfactory rating in 2022, which is lower than the 82% averaged over the last 5 years. Specifically, the portable gauge and fixed gauge subsectors showed marked changes in performance in this SCA: 71% of the 210 portable gauge licensees inspected and 74% of the 91 fixed gauge licensees achieved satisfactory ratings.

The poor performance of the nuclear medicine subsector in the radiation protection SCA has been highlighted in the past few RORs. In 2022, CNSC staff conducted a more detailed analysis of the compliance data for this SCA in general, which revealed that the anticipated transition period following the publication of the revised *Radiation Protection Regulations*, which came into force in late 2020, is continuing to have an impact. Further analysis of the nuclear medicine subsector revealed that approximately 18% of inspected licensees received notices of non-compliance in this SCA that related to the amended regulations, most commonly with respect to new requirements surrounding extremity dosimetry and radiation detection and measurement instrumentation. This led to a rating of below expectations in the radiation protection SCA for those licensees. In other words, non-compliances related to the implementation of the amended regulations by a small number of licensees in the nuclear medicine subsector is reflecting poorly on the entire subsector.

This sort of analysis provides a better understanding of the sources of non-compliances so that appropriate regulatory action can be taken, in this case, by continuing to focus CNSC efforts on ensuring that licensees understand and implement the amendments. For example, CNSC staff issued a DNSR Digest article in 2022 on extremity dosimetry requirements and the provision of information to NEWs. Additional outreach is being planned on the implementation of the new requirements, specifically in the areas where licensees are finding it difficult to demonstrate compliance, such as those related to radiation detection and measurement instrumentation. CNSC staff anticipate that once these issues have been addressed, the satisfactory ratings in the nuclear medicine subsector should increase.

There were 4 unacceptable ratings issued in this SCA. Of that number, 3 were issued to 1 portable gauge licensee as part of multiple inspections of that licensee. Order 1235 was issued in response to the licensee's poor compliance. The inspector found that the licensee had failed to implement a radiation protection program that included an adequate level of management oversight of work practices and personnel qualification and training. The fourth unacceptable rating was issued to a fixed gauge licensee, and order 0600 was issued in response to the findings. The inspection identified repeated items of non-compliance related to worker training, records of authorized workers, and survey meter availability and calibration. In both cases, the licensees complied with the terms of the orders to the satisfaction of the CNSC and the orders were closed.

Refer to appendix C.3 and appendix D for additional information.

3.4 Security

Licensees are required to have in place physical security measures, practices and programs to prevent the loss, illegal use, illegal possession or illegal removal of nuclear substances during their entire lifecycle, including while they are in storage or during transport, as per the NSCA. The extent of the security measures required depends on the types of nuclear substances used and activities performed by each licensee.

In 2022, nuclear substance licensees maintained strong compliance with the security requirements, including the general requirements contained in the regulations and in REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material*, applicable to sealed sources and radiation devices, with 92% of licensees inspected in this SCA receiving satisfactory ratings.

Although there was some fluctuation between sectors, overall, the rate has remained stable and consistent with the 5-year average of 93%.

The drop in compliance in the medical sector in 2021 was rectified in 2022, with licensees in that sector returning to previous levels of compliance. The return to more in-person inspections allowed for more than double the number of inspections to be performed in this SCA in comparison to 2020 and 2021.

The additional data obtained from an increased number of inspections, particularly in the medical sector, confirmed CNSC staff's findings that all sectors performed well in this SCA in 2022.

There were no unacceptable ratings in this SCA.

Refer to appendix C.4 and appendix D for additional information.

3.5 Conventional health and safety for waste nuclear substance licensees

The CNSC requires waste nuclear substance licensees (WNSLs) to have a program in place to manage workplace safety hazards and to protect workers, given the nature of the work and the introduction of other hazards that need to be mitigated. For example, WNSLs handle, process, store and transport different types of radioactive waste, which may require the use of overhead cranes and large equipment. The licensed activities directly introduce mechanical, ergonomic, chemical, electrical and fire hazards that need to be mitigated.

In 2022, no WNSLs received below expectations or unacceptable ratings in the conventional health and safety SCA.

The licensees continued to implement health and safety programs in accordance with the applicable occupational health and safety legislation to protect the health and safety of their workers.

3.6 Environmental protection for waste nuclear substance licensees

WNSLs are required to have specific programs in place to identify, control and monitor all releases of radioactive and hazardous substances and their effects on the environment.

In 2022, no WNSLs received below expectations or unacceptable ratings in the environmental protection SCA. The WNSLs continued to manage and monitor environmental releases relating to licensed activities.

WNSLs reported 3 events that could potentially have impacted the environment in 2022. Information on these events can be found in table 23 of appendix G (event IDs: WNSL-3, WNSL-7, WNSL-8). All radiological releases were below regulatory limits, and there was no impact on the health and safety of persons or on the environment. With regard to non-radiological parameters, in one event, municipal criteria were not met; however, no adverse effects were likely as a result of that situation.

For additional information on how the environmental protection SCA is considered for other licensees covered by this report, please see section 3.7 of the *Regulatory Oversight Report on the Use of Nuclear Substances in Canada:2021*.

4.0 Enforcement

Appendix E presents enforcement action data by sector over the past 5 years and includes a list of all orders issued in 2022.

The CNSC uses a graduated approach to enforcement in order to encourage compliance. When non-compliance (or continued non-compliance) has been identified, CNSC staff assess the significance of the non-compliance and determine the appropriate enforcement action, including, but not limited to, orders and administrative monetary penalties (AMPs). Most enforcement actions are issued as a result of findings during inspections.

In 2022, CNSC staff issued 5 orders and no AMPs. All orders were issued to licensees in the industrial sector, which is consistent with trends in previous years. Four orders were issued after inspections and 1 was issued when a licensee failed to renew its licence. All 5 orders are closed, and the CNSC is satisfied that the licensees have addressed the conditions of the orders.

Although the number of inspections increased in 2022 and there was an apparent decline in performance in some areas (as discussed in section 3.0), the number of enforcement actions issued actually decreased. While this may not be the expected outcome, it is an indication that there were only a very small number of occasions where non-compliance was serious enough to warrant the issuance of an order, which supports CNSC staff's assessment that licensee performance remains acceptable. An order is generally only issued when there is an immediate risk to health, safety or security.

The CNSC responds to non-compliance by taking the actions necessary to restore full compliance. Regulatory judgment is applied and multiple factors, such as the severity of the non-compliance and the associated risk, are considered to determine the most appropriate enforcement strategy for a given situation.

Enforcement actions are posted on the CNSC's regulatory actions web page as they are issued.

5.0 Effective doses to workers

Appendix F presents the full datasets, as well as additional information, on effective doses to workers reported in 2022.

Licensees are required to keep radiation doses to persons below regulatory limits and as low as reasonably achievable (ALARA) in accordance with the radiation protection program referenced in their licence.

Licensees must report the doses to their workers, whether estimated or measured, as part of their annual compliance reports (ACRs). In 2022, doses were reported for 53,822 workers in the 4 sectors. Of those workers, 19,812 were nuclear energy workers (NEWs). The remaining 34,010 were not identified as NEWs and are referred to as non-NEWs in this report. Exposures to radiation continued to be very low for workers covered in this ROR for 2022, consistent with previous reporting years.

In 2022, no NEWs received doses above the regulatory limit of 50 mSv per calendar year. Of the 34,010 non-NEWs for which doses were reported, there were 3 reported doses greater than the regulatory limit of 1 mSv/year, all in the medical sector.

One licensee reported that 2 clerks in the nuclear medicine subsector were reported to have received doses greater than 1 mSv (1.09 mSv and 1.62 mSv), which was deemed unlikely due to the nature of the work performed. The licensee submitted dose change requests for these workers; however, based on the information provided, CNSC staff could not rule out that the doses were real. The dose change requests were not approved.

A second licensee reported a single dose to a non-NEW above the 1 mSv/year limit, specifically a dose of 1.9 mSv, also in the nuclear medicine subsector. The radiation safety officer believes this dose was likely the result of how the dosimeter was stored when the worker in question was on holidays; however, the licensee was not able to reproduce the storage conditions and therefore could not ascertain what part of the dose could be attributed to how the dosimeter was stored. The licensee has opted not to request a dose change for this worker.

There was strong performance in all sectors in 2022, with doses to all workers remaining generally low. Of the 3 reported instances where non-NEWs exceeded the regulatory limit, none of them was believed to be a true dose to the worker.

6.0 Reportable events

Appendix G provides data on the types of events reported over 5 years and provides a summary of each event reported in 2022.

Licensees are required to have programs in place to manage unplanned events and accidents. The events that warrant mandatory reporting and the content of those reports are set out in the NSCA, its regulations and the licence conditions. REGDOC-3.1.3, *Reporting Requirements for Waste Nuclear Substance Licensees, Class II Nuclear Facilities and Users of Prescribed Equipment, Nuclear Substances and Radiation Devices*, sets out requirements and guidance for reports and notifications that licensees must submit to the CNSC. CNSC staff review, assess and track all events reported by licensees.

Since 2014, reported events have been rated using the International Nuclear and Radiological Event Scale (INES), a 7-point scale for communicating the safety significance of nuclear and radiological events to the public. Note that the scale is not a tool for comparing safety performance among facilities or organizations, but rather, for effectively communicating the safety significance of events. CNSC staff assign a ranking to each event based on the INES scale. The events reported to the CNSC by the licensees covered in this ROR typically fall into level 0 (no safety significance) or level 1 (an anomaly that may have an impact on defence in depth).

CNSC staff assessed 167 events related to nuclear substances and prescribed equipment in 2022. Of those events, 164 were rated as INES level 0. The remaining 3 were rated as INES level 1 and were related to the theft of portable gauges. Two of the stolen gauges were recovered and 1 remains missing. The presumption with stolen portable gauges is that they were likely stolen for their potential value as a tool or that they were an incidental theft when a vehicle was stolen as opposed to being stolen for the purpose of obtaining radioactive material.

The 167 reportable events in 2022 represent a stable number when compared to the 171 reported in 2021. There has, however, been a shift in the type of events reported. Of note, there was a decrease in security-related events in 2022 (18 events) compared to 2021 (31 events), which saw an unusual spike in security breaches. Both the commercial and the medical sectors showed a decrease in security-related events in 2022. As reported in the 2021 ROR, one medical sector licensee reported multiple security events in 2021. After the licensee reviewed its program, staff performed a focused security inspection in 2022. The inspection resulted in a satisfactory rating for the security SCA for the licensee. In September 2021, a DNSR Digest on security reminders was sent to all licensees to remind them of their obligations with regard to the security of nuclear substances. The 2022 reporting levels are more consistent with reporting levels in the years prior to 2021. It is important to keep in mind that the actual risk presented by these security-related events was low and that no nuclear substances were lost as a result of any of the events. Licensees employ multi-layered security programs to prevent security-related consequences from occurring.

The other significant change in the type of events reported was an increase in transport-related events in 2022 (59 events) in comparison to 2021 (41 events). Out of the 167 reportable events in 2022, 59 (35%) were related to transport. For the most part (68%), transport events were related to minor motor vehicle accidents (MVAs) where there was no damage to the package being transported and no injury to the driver. Most other events involved minor damage to the packaging during transport or incorrectly packaged nuclear substances (e.g., mislabelled, categorized incorrectly, unexpected dose rate measurements upon receipt). None of these events resulted in any overexposures and none were considered risk-significant; all were rated as INES level 0. Almost a million packages containing nuclear substances are shipped each year in Canada, and only a fraction of a percentage of the total number of shipments are involved in reportable events. The small number of transport events reported in 2022, even though it was an increase from 2021, is not of concern to CNSC staff. In fact, the relatively low number of events – all of which were of low risk significance – provides an indicator of the overall level of safety of the transport of nuclear substances in Canada.

For all events reported to the CNSC, licensees implemented appropriate response measures to mitigate the impacts, limit radiation exposure to workers and the public, and maintain security. CNSC staff reviewed the measures in all cases and found them to be satisfactory.

6.1 Update on Mississauga Metals & Alloys Inc.

Mississauga Metals & Alloys, Inc. (MMA) declared bankruptcy on August 20, 2021, and its waste nuclear substance licence expired on February 28, 2022. In CNSC staff's update to the Commission in November 2022 during the presentation of the *Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2021*, the safety and security of the site, the procurement process for the detailed characterization of the waste, and the ongoing discussions with various parties pertaining to the site were highlighted.

Since that update, a designated officer order was issued to Richter (bankruptcy trustee), MMA and 1420561 Ontario Inc. (landowner) on March 28, 2023. The order requires them to take measures to ensure the safety and security of the nuclear substances onsite, eventually culminating with the removal of the nuclear substances from the property. These entities subsequently had an opportunity to be heard by the Commission regarding the order. The Commission's decision on the order had not been issued at the time of writing this report.

In addition, as a result of a site visit, an order was issued by an inspector to Mr. David Sharpe and MMA on May 24, 2023. The order requires them not to undertake any activities associated with the trailers containing the nuclear substances. On May 30, 2023, Mr. Sharpe and MMA confirmed that they did not wish to exercise their opportunity to be heard on this matter. On July 25, 2023, the designated officer confirmed the order issued on May 24, 2023.

The CNSC continues to engage with other levels of government about the site while ensuring the safety and security of the nuclear substances on the property.

7.0 Outreach and engagement

Appendix I includes a complete list of engagement activities undertaken in 2022.

The CNSC carries out engagement and outreach activities to facilitate communication on licensed activities and regulatory expectations. Engagement and outreach are critical elements of the CNSC's regulatory approach. Given the breadth of licensees regulated in the area of nuclear substances, a particular focus is on reaching and engaging with licensee communities, a practice that leads to increased awareness and better understanding of the regulatory process and requirements. CNSC staff leverage a

variety of fora to engage with licensees and promote the use of the tools that are developed to support compliance with regulatory expectations.

In 2022, outreach was done through a combination of virtual and in-person sessions and through written communications. Outreach included participation in town hall sessions, regular publication of the DNSR Digest, emails to targeted groups of licensees, meetings with associations or working groups, presentations at industry conferences, and the publishing of articles in industry publications. To ensure the DNSR Digest is used to its best advantage (reaching all nuclear substance licensees except for the 4 WNSLs), CNSC staff reached out through the Digest in January 2023 to solicit feedback on any topics that licensees may be interested in hearing about. At the time of writing this report, no suggestions had been received by staff.

In addition to these outreach and engagement opportunities, after the presentation of the 2021 ROR on the use of nuclear substances in November 2022, CNSC staff reached out to the 3 stakeholders who took the opportunity to comment on the ROR through the intervention process: Canadian Environmental Law Association, Nuclear Transparency Project and Canadian Radiation Protection Association. For each intervention, staff created a table of comments and recommendations related to the ROR and responded to each one individually. Staff then shared the relevant responses with each intervenor and offered to meet with the stakeholders to discuss the responses if needed. Although receipt of the drafted responses was acknowledged by all 3 intervenors, at the time of writing this report, only 1 intervenor had requested a specific meeting with CNSC staff, to be held in mid-September prior to the presentation of this report. Table 26 and table 27 summarize the number of comments responded to and the number of comments by area of interest submitted by the intervenors.

To date, Indigenous Nations and communities have not expressed a specific interest in this ROR and very little interest in the licensed activities that it covers. However, upon request, CNSC staff have participated in general outreach activities with Indigenous Nations and communities to provide information on the packaging and transport of nuclear substances. In addition, staff participated in outreach and engagement activities for the proposed Wheeler River environmental assessment with Indigenous Nations and communities potentially impacted by the project, which included attending culture camps with 2 communities. CNSC staff explained the licensing process for a nuclear substance licence. CNSC staff remain open and committed to ongoing engagement and communication with any interested Indigenous Nations and communities who may express an interest in discussing the topics and licenses covered in this ROR.

Staff are committed to continued openness and transparency with licensees, Indigenous Nations and communities, the public and other stakeholders. For a complete list of outreach activities, refer to table 25 in appendix I.

8.0 Safeguards

The Government of Canada has obligations on the peaceful use of nuclear energy pursuant to the *Treaty on the Non-proliferation of Nuclear Weapons*. CNSC requirements for nuclear substance licensees relating to Canada's international obligations are defined in the applicable regulations and licences.

Safeguards involve a system of inspection and other verification activities undertaken by the International Atomic Energy Agency (IAEA) to evaluate Canada's compliance with its obligations under its safeguards agreements with the IAEA. The objective of the Canada–IAEA safeguards agreements is for the IAEA to provide assurance to Canada and to the international community that all declared nuclear materials are being used for peaceful, non-explosive purposes and that there is no indication of undeclared nuclear materials or activities. The CNSC has published REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*, which sets out the requirements and guidance for the establishment and maintenance of a

safeguards program. Safeguarded materials include uranium, thorium and plutonium-239. Generally, among the licensees covered in this report, this material can be present as samples, check sources and shielding, among other forms. Licensees subject to safeguards have a condition included in their licence, and the CNSC continues to engage with licensees to ensure that all nuclear material subject to safeguards is reported to the IAEA.

In 2022, the IAEA performed 4 inspections and 3 complementary accesses at the facilities of nuclear substance licensees to confirm licensees' declarations on the possession and use of nuclear material. While the IAEA reported that the results of these inspections were satisfactory and that its inspectors were able to carry out all planned activities for the complementary accesses, it identified areas for improvement associated with maintaining proper segregation of exempted material from other sources and making some corrections to nuclear material documents (i.e., list of inventory items). None of these issues are safety-significant. The CNSC has communicated these areas of improvement to the affected licensees, and staff are monitoring the licensees' corrective actions.

CNSC staff ensure that licensees implement the measures required to meet Canada's international obligations.

9.0 International regulations and other commitments

The mandate of the CNSC includes adherence to international commitments to which Canada is a party.

Canada has committed to the implementation of various IAEA codes, standards and guidance documents. For example, as part of Canada's commitment to the IAEA *Code of Conduct on the Safety and Security of Radioactive Sources* and the associated *Guidance on the Import and Export of Radioactive Sources*, nuclear substance licensees with Category 1 and/or 2 (high-risk) sealed sources must inform the CNSC of any transfer, receipt, export or import of those sources. Licensees report their high-risk sealed sources inventory through the Sealed Source Tracking System (SSTS). The SSTS is a secure information management system that tracks new and existing high-risk sources within Canada. It populates the National Sealed Source Registry so that the information is as current as licensee reporting allows. Licensees subject to this requirement have the relevant licence condition included in their licence, and compliance with this condition is verified through a regulatory inspection. Canada has also committed to the IAEA's *Guidance on the Management of Disused Radioactive Sources*, which is supplementary guidance to the Code of Conduct and is intended to consolidate and provide details on the management of disused sources. Every 3 years, Canada must present a report on the implementation of the Code and its supplementary guidance at a meeting of IAEA member states. The most recent report covered the period from January 2019 to December 2022.

Nuclear substance licensees who import or export nuclear substances are subject to licence conditions that limit the types and amounts of nuclear substances that they can import or export without a separate, valid import/export licence. Licensees must meet the requirements set out in the *Nuclear Non-proliferation Import and Export Control Regulations*. In addition, REGDOC-2.13.2, *Import and Export*, sets out guidance for current and prospective licensees who intend to import or export risk-significant radioactive sources (Categories 1 and 2 radioactive sources). Compliance with import and export restrictions is verified during inspections.

In addition, the CNSC considers international regulations and standards when developing domestic regulations. For example, the *Packaging and Transport of Nuclear Substances Regulations, 2015*, with which all licensees and non-licensees must comply, incorporate by reference the IAEA *Regulations for the Safe Transport of Radioactive Material*. While this is the only case where the IAEA regulations are referenced directly in the domestic regulations, current CNSC regulations that apply to licensees covered

by this report are generally based on international regulations and standards, including relevant safety standards and other IAEA publications.

In 2019, Canada was the subject of an IAEA Integrated Regulatory Review Service (IRRS) mission, the main purpose of which was to perform a peer review of Canada's regulatory framework for nuclear and radiation safety against IAEA safety standards, which are the international benchmark for safety. Appendix VI of the final report includes a list of IAEA reference material used for the review. Based on this review, Canada was found to have a comprehensive and robust regulatory framework for nuclear and radiation safety covering current facilities and activities, including those covered by this regulatory oversight report. While not explicitly referenced, IAEA safety standards are translated into regulatory requirements or licence conditions for licensees covered in this report.

10.0 Conclusion

In 2022, most inspected licensees were in compliance with regulatory requirements and achieved satisfactory ratings in the SCAs reported on in this report. Licensing and certification activities continued to play a critical role in ensuring that effective licensee programs were in place, and these programs contributed significantly to overall licensee performance. Where compliance did not meet expectations, licensees implemented appropriate corrective actions. All 5 escalated enforcement actions issued in 2022 have been closed. Radiation exposure to workers continued to be very low and was consistent with previous years. When events did occur, licensees took appropriate measures to address the events and took steps to prevent recurrence. Staff continue to address the backlog of inspections and will continue to monitor for possible negative trends in compliance over the coming years.

The evaluations of the SCA findings, resulting from the CNSC's comprehensive regulatory oversight of the industry, demonstrate that licensees made acceptable provisions to protect health, safety, security and the environment from the use of nuclear substances and prescribed equipment, and implemented the measures required to meet Canada's international obligations. Based on these evaluations, CNSC staff conclude that the use of nuclear substances and prescribed equipment in Canada remains safe and secure.

Appendix A: Licensed activities covered in this report

Licensed activities covered in this report are extremely varied and, for ease of reporting, have been divided into 4 sectors: medical, industrial, academic and research, and commercial. Each of these sectors is described briefly below.

Medical

Licensees in the medical sector use nuclear substances and operate accelerators and other equipment for diagnostic and therapeutic purposes in hospitals and medical clinics. Medical applications using radiopharmaceuticals are designed to target specific tissues and organs, allowing for the delivery of nuclear substances to specific areas of the body for diagnostic testing or treatment.

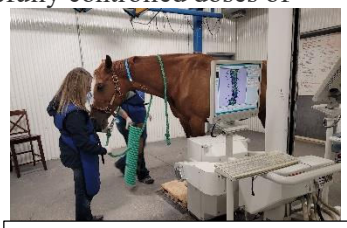
Diagnostic nuclear medicine studies assist in the diagnosis of medical conditions based on the physiological functions of organs, tissues or bones. Radiopharmaceuticals containing nuclear substances such as technetium-99m, gallium-67 and fluorine-18 are administered to patients for imaging purposes. Examples of common nuclear medicine diagnostic procedures include cardiac scans (to visualize heart function and blood flow), bone scans (to evaluate bone metabolism, infection or tumours) and renal scans (to evaluate kidney function).

Radioisotopes are also used in many therapeutic procedures. For example, iodine-131 is used to treat diseases of the thyroid gland, while other isotopes, such as yttrium-90, may be used in conjunction with antibodies for site-specific treatment of certain cancers.

Leksell Gamma Knife (Image source: International Atomic Energy Agency)

Radiation therapy devices are used to treat cancer, either via an external beam of radiation or by placing radioactive sources inside cancerous tissues. Medical linear accelerators are the most common type of equipment used for therapeutic purposes. These devices are used to treat cancer by delivering carefully controlled doses of radiation to cancerous tissue.

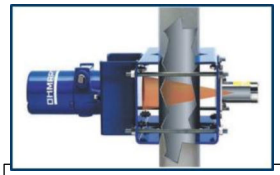
Veterinary nuclear medicine uses techniques like those employed in human nuclear medicine. Veterinary clinics across the country offer a wide range of diagnostic and therapeutic nuclear medicine procedures and, in some cases, radiation therapy treatment using medical accelerators or teletherapy.



Horse undergoing a bone scan (Image source: CNSC)

Industrial

Licensees in the industrial sector use nuclear substances either in industrial facilities or as part of fieldwork or construction. Typical applications include the measurement of physical parameters such as density, moisture content and geological composition in civil engineering. Nuclear substances are also used for material examination in civil engineering, and for level and flow rate measurements in industrial processes (such as oil and gas exploration, mining and manufacturing). They are found in radiation devices such as fixed nuclear gauges, which monitor production processes in many industries, and portable nuclear gauges, which are often used to measure moisture and density in soil and the compaction of asphalt in road construction.



Fixed gauge mounted on a pipe (Image source: Ohmart Vega)

Exposure device (Image source: Welding and NDT Institute)

In industrial radiography, nuclear substances are used in exposure devices for the non-destructive examination of materials. Anyone operating an exposure device or supervising a trainee in the operation of such device must be certified by the CNSC. Exposure devices used for industrial radiography are engineered and operated using multiple safety barriers to reduce the potential for accidental occupational exposure. One example is dense material, such as depleted uranium, which shields people against the intense radioactivity of the source contained inside the device.

Industrial applications of nuclear substances are as varied as the processes to which they are applied. Specific radioisotopes are chosen based on the type of radiation they emit, the intensity of their radiation and the intended application. For example, the nuclear substance chosen for industrial radiography depends on the size and density of the material to be imaged. Cobalt-60, with its high-energy gamma radiation, is used for large structures and dense materials such as structural concrete. When the material does not require the penetrating power of cobalt-60, other nuclear substances, such as iridium-192 or selenium-75, are used instead. Cesium-137, another gamma emitter, is most commonly used in portable and fixed gauges to measure density. In other industrial uses, like measuring moisture content for example, portable gauges most commonly use neutron-emitting nuclear substances such as americium-241/beryllium.

Academic and research

Research irradiator (Image source: Hopewell Designs)

Licensed activities in the academic and research sector are conducted in universities, colleges and research laboratories, and focus mainly on biological and biomedical research that primarily uses open (unsealed) nuclear substances. This sector also uses sealed sources, radiation devices and accelerators for teaching and for pure and applied research, as well as irradiators to irradiate cells or samples in laboratories.

Commercial

Cyclotron (Image source: CNSC)

Licensed activities in the commercial sector involve the production, processing, storage and distribution of nuclear substances, the calibration of radiation detection instruments, and the servicing of radiation devices and Class II prescribed equipment for commercial purposes. Waste nuclear substance licences also fall under the commercial sector.

Additional information about the licensed activities covered by this report can also be found in the technical briefing to the Commission on nuclear substances in Canada (CMD 18-M49) and on the CNSC website, which also includes various resources geared towards licensees.

Appendix B: Regulatory program for the use of nuclear substances

This appendix presents additional regulatory data to complement the information provided in the main part of the document.

B.1 Designated officer decisions

CNSC designated officers made a total of 2,045 licensing and certification decisions related to activities covered in this report in 2022. The majority of these were licensing decisions, as shown in table 1. There was no significant change in the number or type of decisions made compared to 2021.

Table 1: Designated officer licensing and certification decisions in 2022, all sectors combined

Type of decision	Number of decisions
Licensing (issuance of new licences, licence renewals, licence amendments, licence revocations and licence transfers)	1,619
Certification of prescribed equipment (radiation devices, Class II prescribed equipment, and transport packages)	69
Certification of exposure device operators (issuance of new certifications and renewal of certifications)	337
Certification of Class II radiation safety officers	20
Total	**2,045**

The CNSC's risk-informed regulatory program applies resources and regulatory oversight commensurate with the risk associated with the regulated activity. Regulatory effort related to licensing, certification and compliance verification is derived from this program.

B.2 Licensing

In 2022, there were 2,080 nuclear substances and prescribed equipment licences (table 2) held by 1,479 licensees across Canada, as shown in figure 3. An additional 52 licences were held by companies headquartered in other countries (primarily the United States). Many of these companies service prescribed equipment located in Canada, while others have operational facilities in Canada.

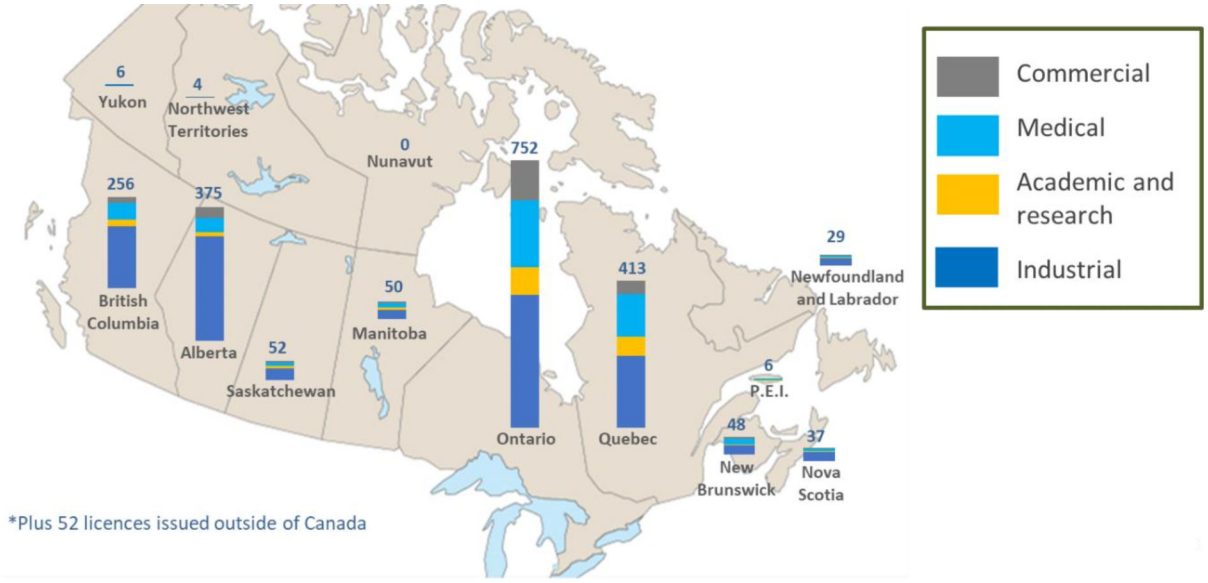
The disparity between the number of licences and the number of licensees can be explained by the fact that while most licensees perform a single licensed activity and therefore require only one CNSC licence, others perform varied activities that require a licence for each one. For example, a hospital may have multiple licences to cover radiation therapy facilities, diagnostic nuclear medicine, therapeutic nuclear medicine, nuclear substance processing, and research labs, each of which is covered by its own licence given the unique requirements and programs. CNSC staff work with these licensees to ensure that an appropriate level of regulatory control is maintained, while minimizing administrative burden wherever possible.

An overview of the licensing process is available in section 1.0 of this ROR.

Table 2: Number of licences by sector, 2018 to 2022

Sector	2018	2019	2020	2021	2022
Medical	436	438	445	440	443
Industrial	1,259	1,228	1,207	1,221	1,205
Academic and research	192	187	189	187	185
Commercial	248	237	238	249	247
Total	**2,135**	**2,090**	**2,079**	**2,097**	**2,080**

Figure 3: Licence distribution



B.3 Certification of prescribed equipment

Certification of prescribed equipment confirms that the equipment is safe to use; that adequate measures are in place to protect the environment, the health, safety and security of persons, and national security; and that the design meets international requirements. Prescribed equipment includes radiation devices, Class II prescribed equipment, and transport packages, and the requirements for certification are set out in the regulations. As seen in table 1, designated officers made 69 decisions related to the certification of prescribed equipment in 2022, consistent with the 70 decisions made in 2021. As in the case of licensing, CNSC staff perform risk-informed technical assessments of certification applications submitted to the CNSC. The CNSC has regulatory documents in place to ensure that its expectations for applicants are clear. Service standards for the certification of Class II prescribed equipment, radiation devices, and transport packages are posted on the CNSC website. The lists of certified transport packages and special form radioactive material, Class II prescribed equipment and radiation devices are available on the CNSC website.

B.4 Certification of exposure device operators

Licensees are required under the *Nuclear Substances and Radiation Devices Regulations* to permit only CNSC-certified personnel and supervised trainees to use exposure devices containing nuclear substances.

In 2022, the CNSC certified 69 new exposure device operators (EDOs) and renewed the certifications of 268 others, compared to 2021 when the CNSC certified 61 new EDOs and renewed 318 certifications. CSA Group's *CSA PCP-09: Exposure Device Operator Personnel Certification Guide*, was revised and posted in January 2022 and fully implemented in August 2022. Additional information on the EDO program can be found on the CNSC website.

B.5 Certification of Class II radiation safety officers

All licensees that operate Class II nuclear facilities or that service Class II prescribed equipment must have a certified radiation safety officer (RSO) and a qualified temporary replacement. The RSO ensures that licensed activities are conducted safely and that all regulatory requirements are met.

In 2022, the CNSC certified 20 Class II RSOs, compared to 15 in 2021. As in 2021, no Class II RSOs were decertified in 2022.

In 2022, the CNSC published discussion paper DIS-22-01, *Proposal to Amend the Class II Nuclear Facilities and Prescribed Equipment Regulations*, which included potential revisions to the regulations, such as the introduction of provisions allowing for the amendment and expiry of certificates issued to Class II RSOs and for the recertification of RSOs. Since the comment period on this discussion paper closed in late 2022, the comments are still under review by CNSC staff.

Appendix C: Compliance performance

This appendix provides details regarding compliance in the 4 SCAs determined to be the most relevant in providing an overall indication of the safety performance of licensees in 2022.

It is important to note that a below expectations rating does not necessarily mean that a licensee's actions were unsafe. It could mean any of the following: licensee performance does not meet CNSC staff expectations, the licensee has risk-significant non-compliance(s) or performance issue(s), and/or non-compliances or performance issues are not being adequately corrected. Staff will issue unacceptable ratings in cases where licensee actions are unsafe – in 2022, only 4 unacceptable ratings were issued across all SCAs.

In all cases, for any below expectations ratings, CNSC staff ensured that licensees took appropriate corrective actions. For all unacceptable ratings, CNSC staff issued orders or took licensing action, with restrictions lifted only once the CNSC was satisfied that all conditions had been addressed by the licensee.

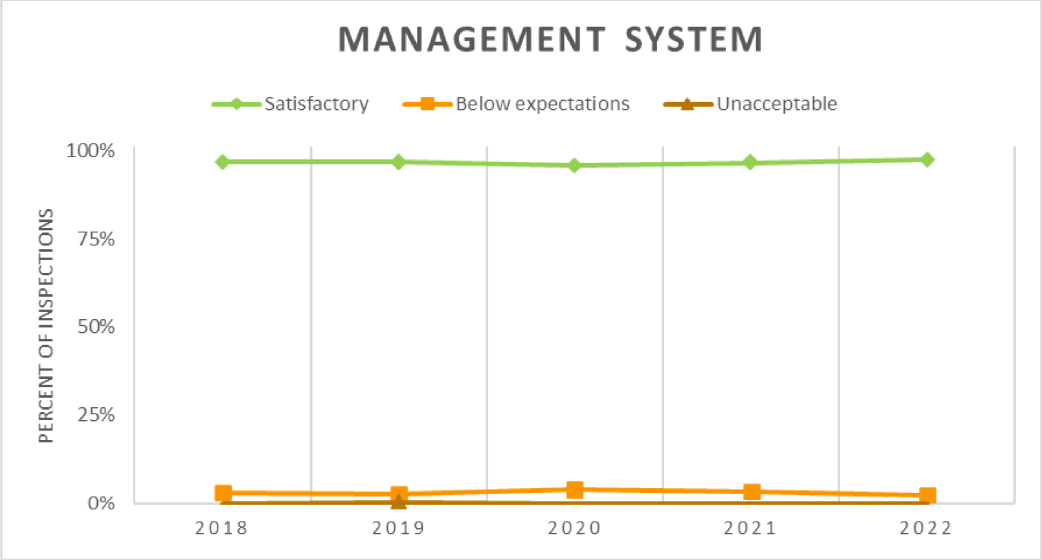
Given the small number of WNSLs, specific data related to the environmental protection and the conventional health and safety SCAs is not included in this section.

C.1 Management system

Of the 597 inspections that looked at the management system SCA, 98% of the licensees inspected demonstrated that adequate processes and programs were in place to achieve their safety objectives and therefore received satisfactory ratings (figures 4 and 5). Figure 5a compares the 2022 ratings to the 5-year average by sector.

There were no unacceptable ratings in this SCA.

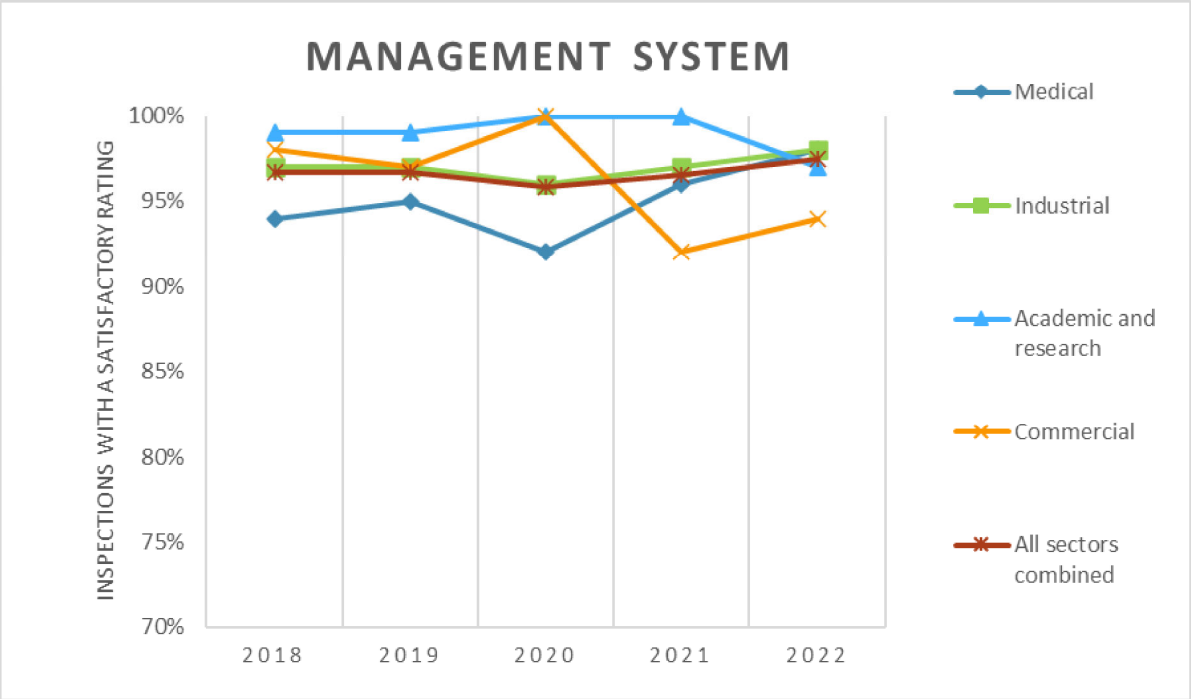
Figure 4: Inspection ratings for the management system SCA, 2018 to 2022



	2018	2019	2020	2021	2022
Satisfactory	843	739	321	472	582
Below expectations	29	22	14	17	15
Unacceptable	0	3	0	0	0
Total	872	764	335	489	597

Number of inspections

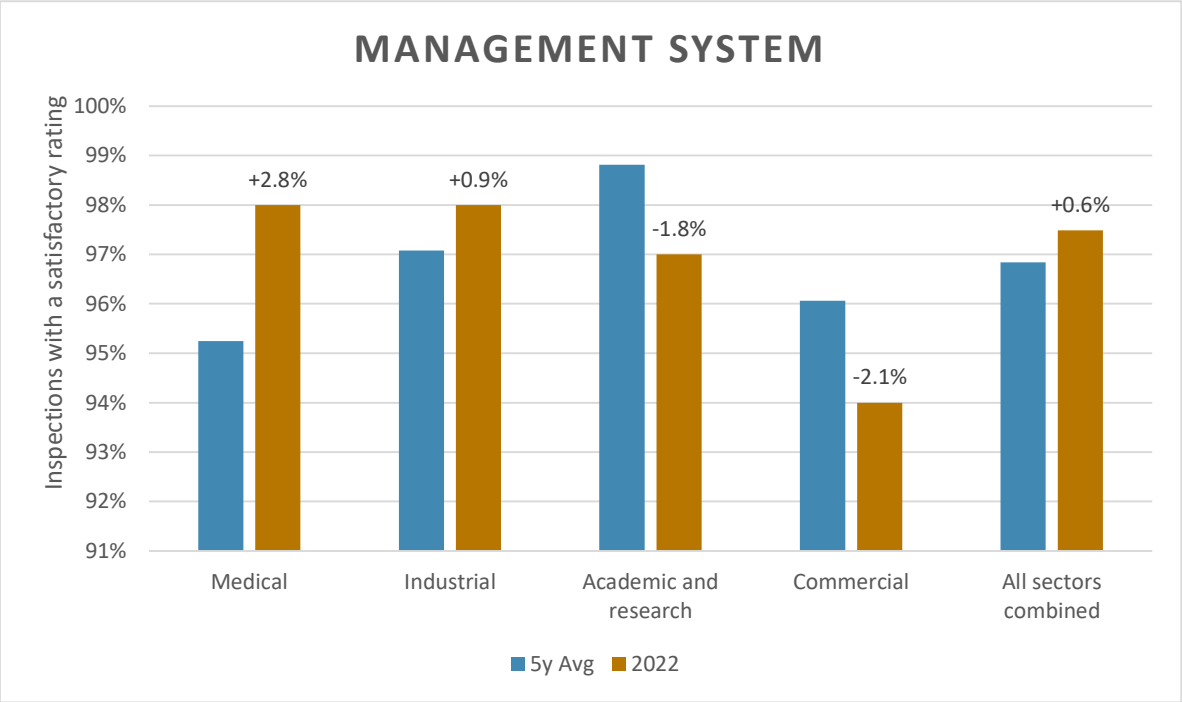
Figure 5: Sector-by-sector comparison of satisfactory inspection ratings for the management system SCA, 2018 to 2022



	2018	2019	2020	2021	2022
Medical	110	155	44	101	93
Industrial	608	475	254	329	427
Academic and research	85	73	9	18	33
Commercial	40	36	14	24	29
All sectors combined	843	739	321	472	582

Number of inspections with a satisfactory rating

Figure 5a: Sector-by-sector comparison of satisfactory inspection ratings for the management system SCA, 2022 versus the 5-year average (2018 to 2022)

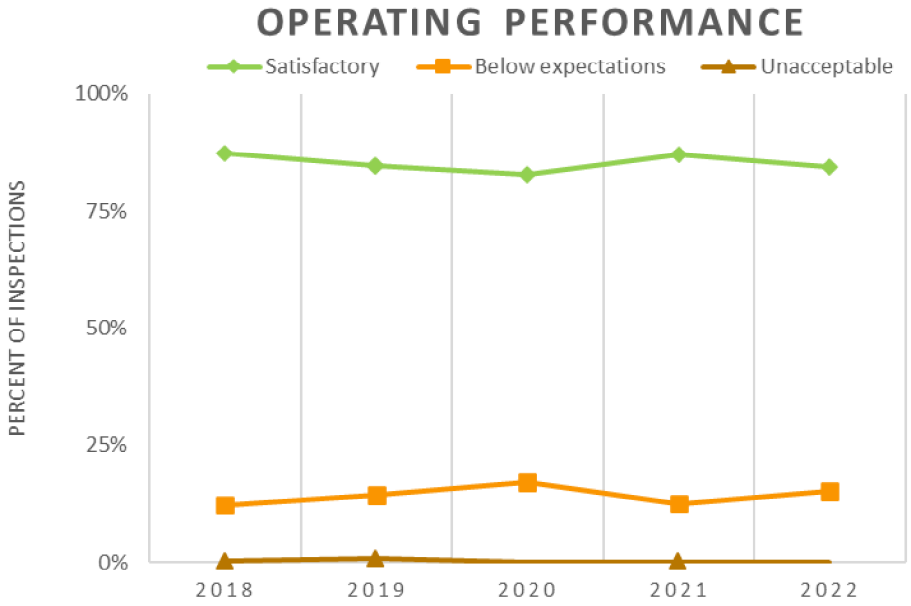


C.2 Operating performance

Of the 616 inspections that looked at the operating performance SCA, 85% of the licensees inspected demonstrated that adequate processes and programs were in place to achieve their safety objectives and therefore received satisfactory ratings (figures 6 and 7). Figure 7a compares the 2022 ratings to the 5-year average by sector.

There were no unacceptable ratings in this SCA.

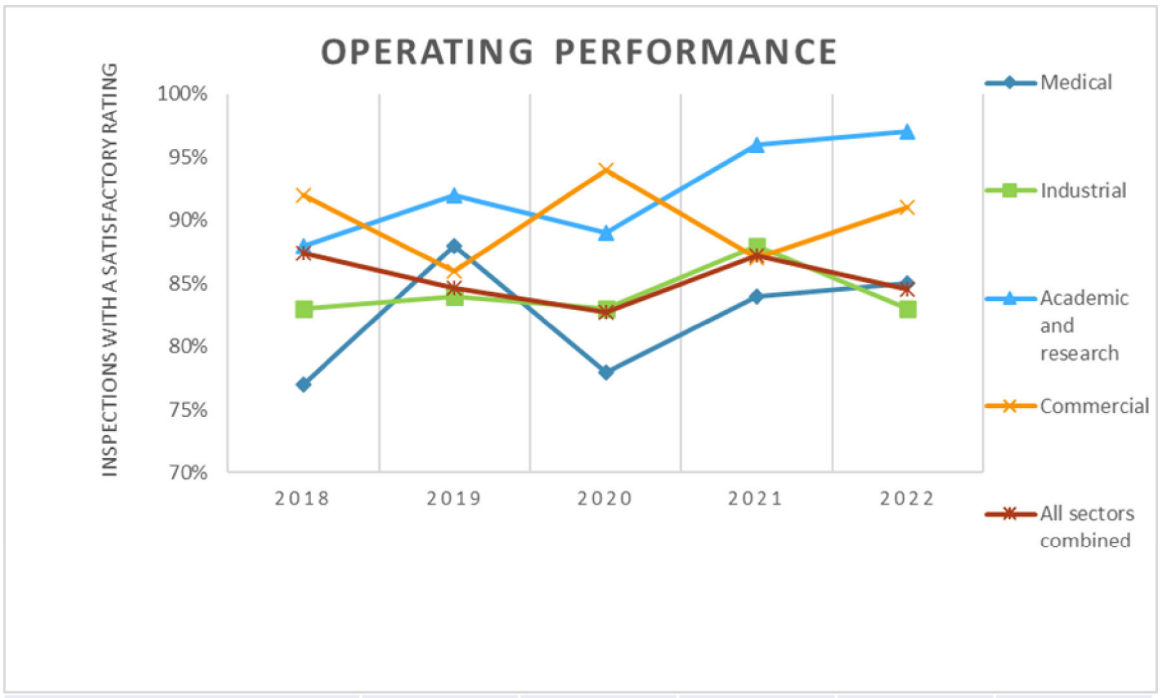
Figure 6: Inspection ratings for the operating performance SCA, 2018 to 2022



	2018	2019	2020	2021	2022
Satisfactory	747	672	292	463	521
Below expectations	144	110	61	67	95
Unacceptable	4	2	0	1	0
Total	895	784	353	531	616

Number of inspections

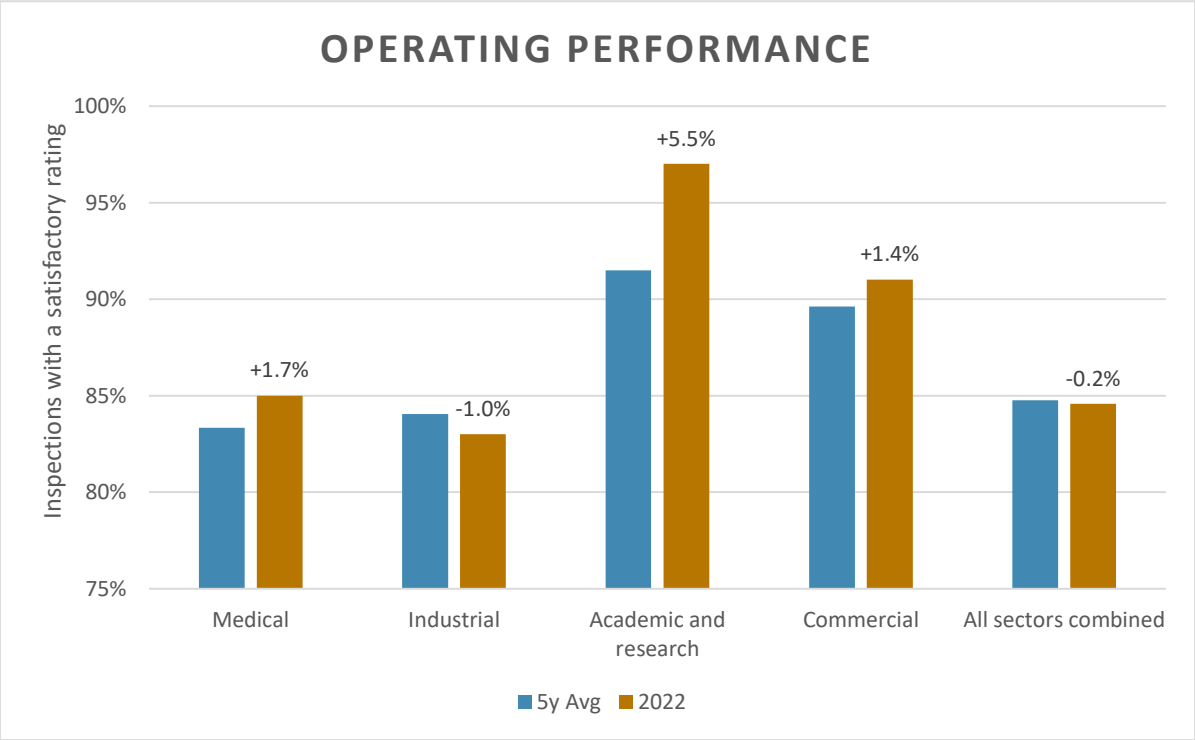
Figure 7: Sector-by-sector comparison of satisfactory inspection ratings for the operating performance SCA, 2018 to 2022



	2018	2019	2020	2021	2022
Medical	96	155	41	97	88
Industrial	528	409	225	318	368
Academic and research	79	70	9	22	35
Commercial	44	38	17	26	30
All sectors combined	747	672	292	463	521

Number of inspections with a satisfactory rating

Figure 7a: Sector-by-sector comparison of satisfactory inspection ratings for the operating performance SCA, 2022 versus the 5-year average (2018 to 2022)

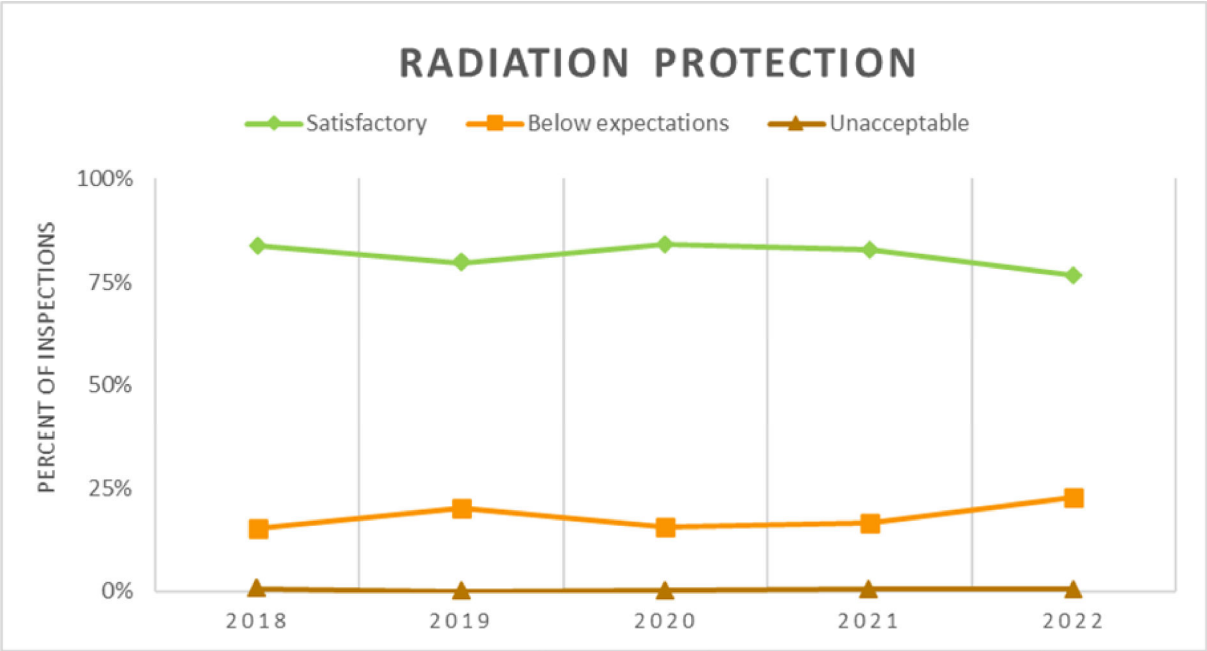


C.3 Radiation protection

Of the 630 inspections that looked at the radiation protection SCA, 77% of the licensees inspected demonstrated that adequate processes and programs were in place to achieve their safety objectives and therefore received satisfactory ratings (figures 8 and 9). Figure 9a compares the 2022 ratings to the 5-year average by sector.

In all, 4 unacceptable ratings were issued in this SCA to 2 industrial sector licensees. Three of the unacceptable ratings were issued to 1 portable gauge licensee as part of multiple inspections. Order 1235 was issued in response to the poor compliance of this licensee. The fourth unacceptable rating was issued to a fixed gauge licensee, and order 0600 was issued in response to the findings. Details on these unacceptable ratings can be found in section 3.3.

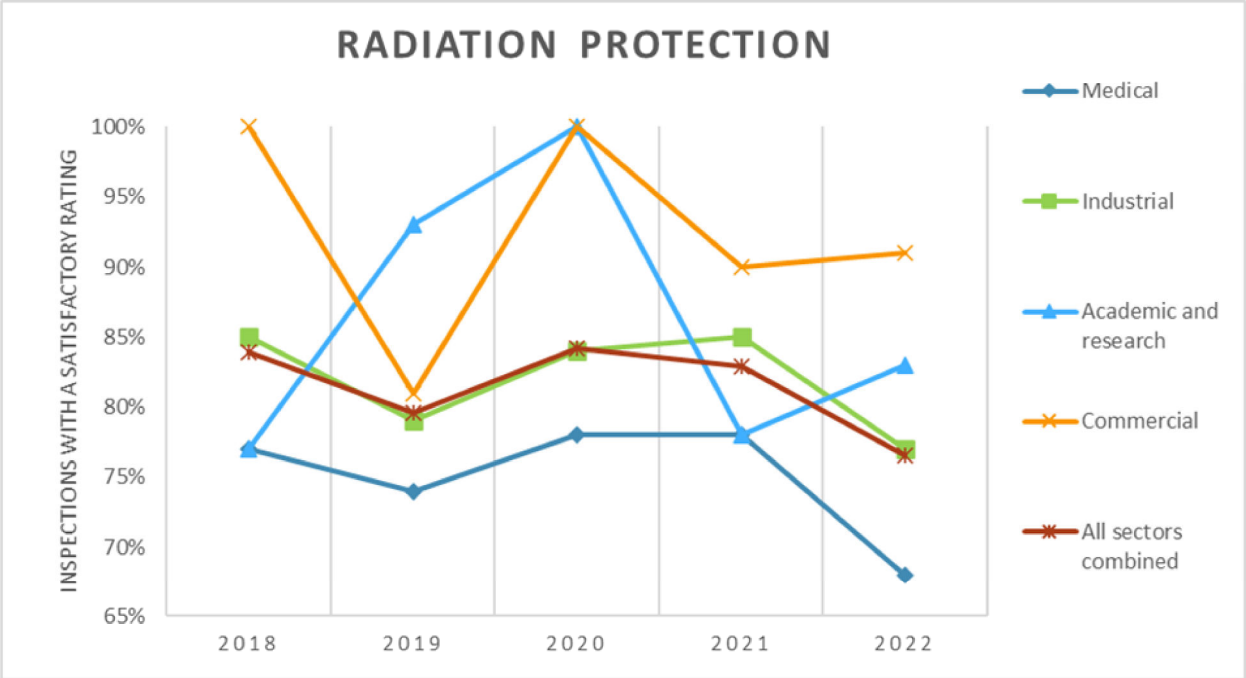
Figure 8: Inspection ratings for the radiation protection SCA, 2018 to 2022



	2018	2019	2020	2021	2022
Satisfactory	748	629	299	465	482
Below expectations	137	160	55	93	144
Unacceptable	6	1	1	3	4
Total	891	790	355	561	630

Number of inspections

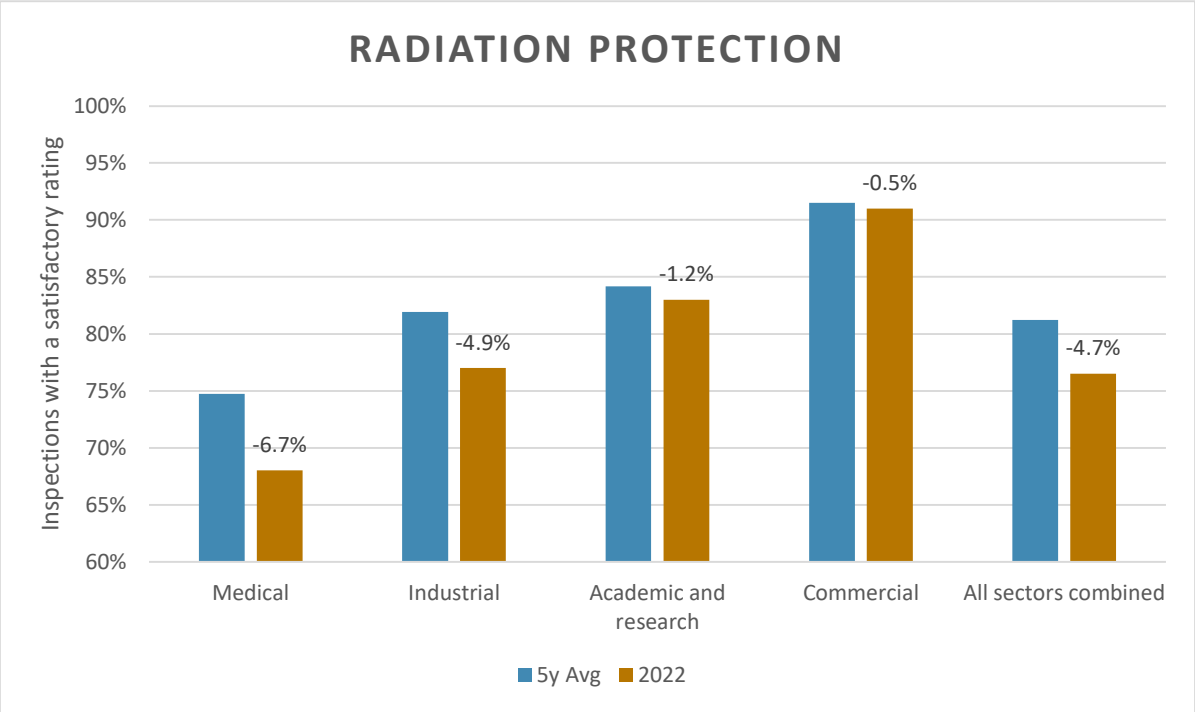
Figure 9: Sector-by-sector comparison of satisfactory inspection ratings for the radiation protection SCA, 2018 to 2022



	2018	2019	2020	2021	2022
Medical	95	132	42	113	80
Industrial	539	387	227	308	343
Academic and research	68	71	9	18	29
Commercial	46	39	21	26	30
All sectors combined	748	629	299	465	482

Number of inspections with a satisfactory rating

Figure 9a: Sector-by-sector comparison of satisfactory inspection ratings for the radiation protection SCA, 2022 versus the 5-year average (2018 to 2022)

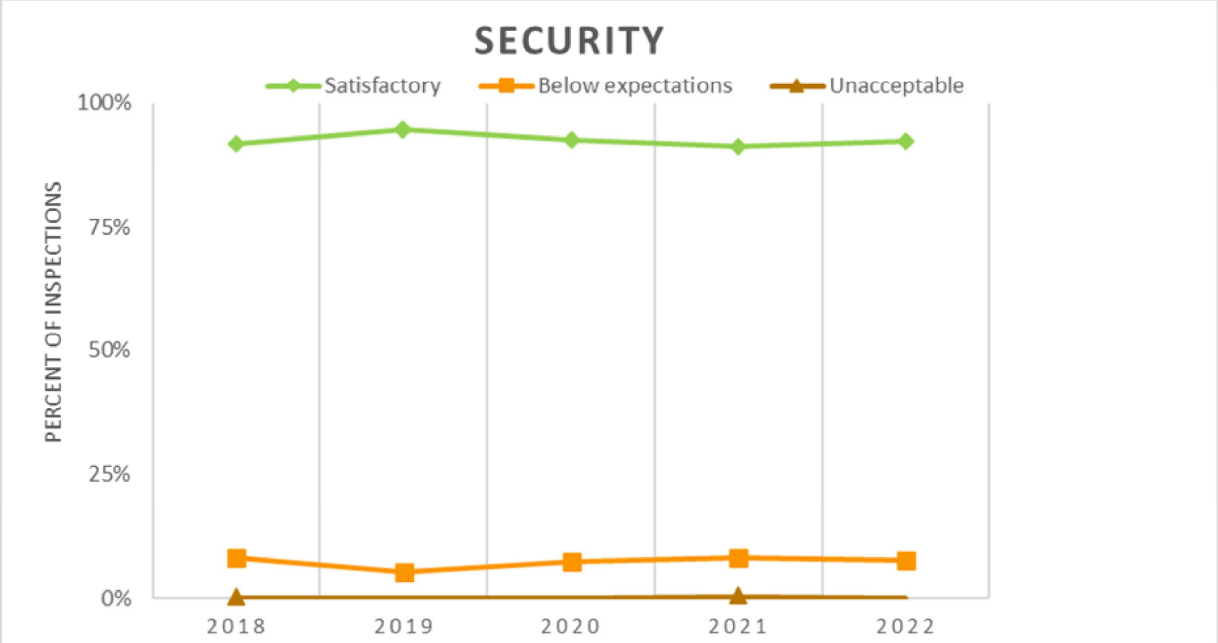


C.4 Security

Of the 502 inspections that looked at the security SCA, 92% of the licensees inspected demonstrated that adequate processes and programs were in place to achieve their safety objectives and therefore received satisfactory ratings (figures 10 and 11). Figure 11a compares the 2022 ratings to the 5-year average by sector. The marked increase in the number of inspections of this SCA is directly related to the return to in-person inspections.

There were no unacceptable ratings in this SCA.

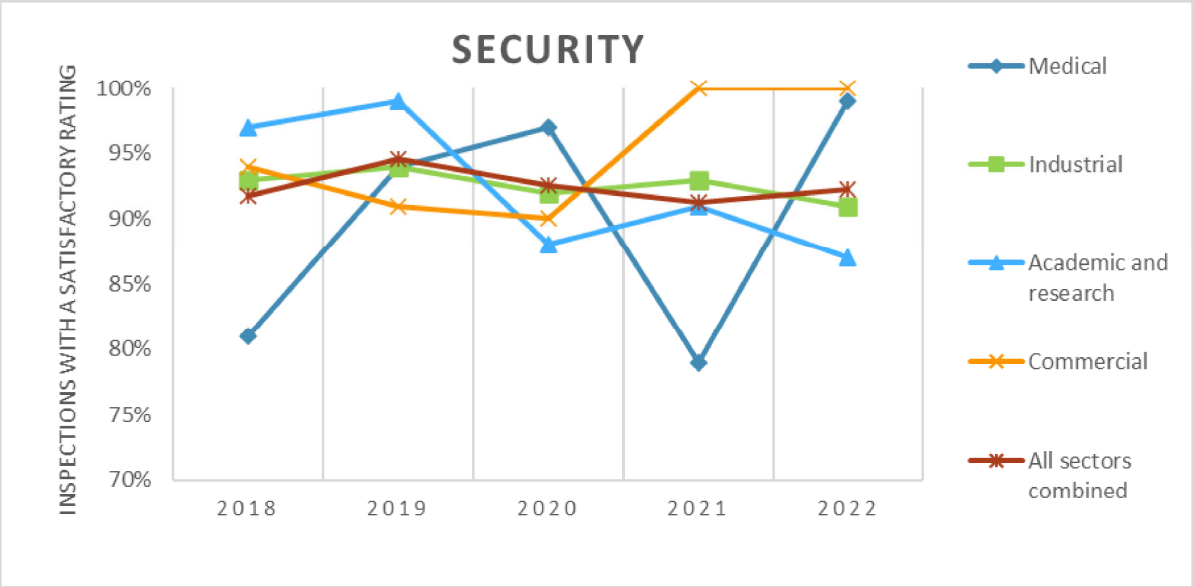
Figure 10: Inspection ratings for the security SCA, 2018 to 2022



	2018	2019	2020	2021	2022
Satisfactory	764	719	163	208	463
Below expectations	68	41	13	19	39
Unacceptable	1	0	0	1	0
Total	833	760	176	228	502

Number of inspections

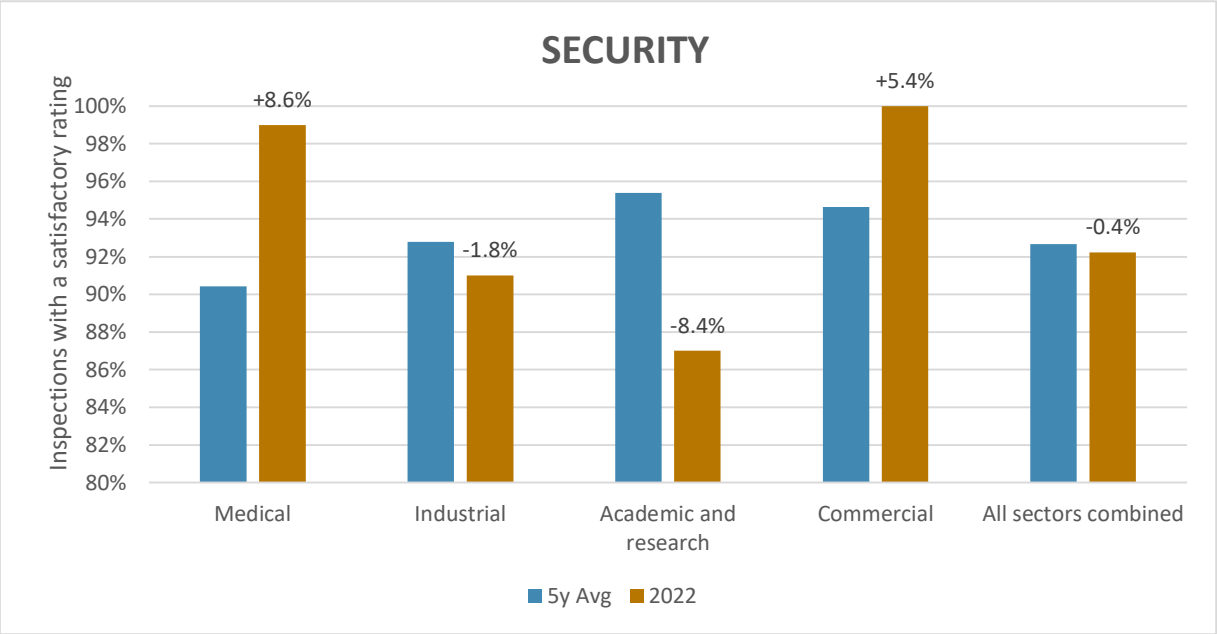
Figure 11: Sector-by-sector comparison of satisfactory inspection ratings for the security SCA, 2018 to 2022



	2018	2019	2020	2021	2022
Medical	96	158	31	27	80
Industrial	587	457	116	155	335
Academic and research	57	72	7	10	26
Commercial	46	32	9	16	22
All sectors combined	786	719	163	208	463

Number of inspections with a satisfactory rating

Figure 11a: Sector-by-sector comparison of satisfactory inspection ratings for the security SCA, 2022 versus the 5-year average (2018 to 2022)



Appendix D: Inspection ratings by sector

This section provides data at the sector and subsector levels for each of the 4 key SCAs covered in this report. Any significant findings at the SCA level have been further explained in section 3.0 of this report, where additional analysis is included for the management system, operating performance, radiation protection and security SCAs. Given the small number of WNSLs, specific data related to the environmental protection and the conventional health and safety SCAs are not included in this section.

A breakdown by subsector is not provided for the security SCA, given the potentially sensitive information associated with that SCA.

D.1.1 Medical sector

Tables 4 to 7 show the inspection performance of licensees in the medical sector. Subsector performance for the years 2018 to 2022 is shown as a percentage of the inspections that received satisfactory ratings for the SCA. The total number of inspections conducted to assess performance in the SCA appears in parentheses. The number of inspections shown in the "Entire medical sector" row is the aggregate for the entire sector, including subsectors not highlighted.

Table 4: Management system – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the medical sector and selected subsectors, 2018 to 2022

SCA	Subsector / sector	2018	2019	2020	2021	2022
Management system	Nuclear medicine	96% (103)	95% (103)	94% (47)	99% (89)	97% (76)
Management system	Radiation therapy	50% (6)	100% (4)	0% (1)	70% (10)	100% (9)
Management system	Veterinary nuclear medicine	100% (4)	75% (4)	(0)	100% (3)	100% (7)
Management system	Entire medical sector	94% (117)	95% (163)	92% (48)	96% (105)	98% (95)

Table 5: Operating performance – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the medical sector and selected subsectors, 2018 to 2022

SCA	Subsector / sector	2018	2019	2020	2021	2022
Operating performance	Nuclear medicine	77% (104)	87% (155)	77% (48)	83% (89)	84% (76)
Operating performance	Radiation therapy	67% (12)	100% (21)	100% (2)	90% (10)	100% (15)
Operating performance	Veterinary nuclear medicine	100% (4)	100% (3)	100% (1)	100% (3)	75% (8)
Operating performance	Entire medical sector	77% (124)	88% (176)	77% (51)	84% (115)	85% (103)

There was a significant drop in the performance of veterinary nuclear medicine licensees in this SCA; however, with the small number of inspections performed, it is difficult to say whether this is representative of the subsector as a whole given that this decrease was the result of only 2 inspections that received ratings of below expectations. Both of those inspections were priority 1 inspections as the licensees had not been seen in over 5 years.

Table 6: Radiation protection – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the medical sector and selected subsectors, 2018 to 2022

SCA	Subsector / sector	2018	2019	2020	2021	2022
Radiation protection	Nuclear medicine	74% (104)	70% (155)	73% (48)	75% (119)	63% (91)
Radiation protection	Radiation therapy	100% (12)	100% (13)	100% (2)	100% (20)	93% (15)
Radiation protection	Veterinary nuclear medicine	50% (4)	100% (3)	100% (1)	33% (3)	63% (8)
Radiation protection	Entire medical sector	77% (124)	74% (178)	76% (51)	78% (145)	68% (118)

The nuclear medicine subsector demonstrated lower performance in the radiation protection SCA in 2022 in comparison to previous years, although ratings have been consistently low over the last 5 years. The most frequent items of non-compliance in 2022 include the ascertainment and recording of doses, the failure to demonstrate that sampling and counting methods meet licence criteria for detecting loose contamination, and failure to post radiation warning signs that meet regulations. These items are related to inadequate management oversight in the implementation of the radiation protection program. CNSC staff continue to work with these licensees to correct items of non-compliance and to work on program

deficiencies. While staff continue to prioritize inspections for medium-risk licensees, such as those in the nuclear medicine subsector, the focus is currently on those licensees that are overdue for inspections. Staff are satisfied with this prioritization, as most non-compliances are not serious in nature.

; however, with the small number of inspections performed, it is difficult to say whether this is representative of the subsector.

Table 7: Security – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the medical sector, 2018 to 2022

SCA	Sector	2018	2019	2020	2021	2022
Security	Medical sector	91% (119)	94% (168)	97% (33)	79% (34)	99% (81)

D.1.2 Industrial sector

Tables 8 to 11 show the inspection performance of licensees in the industrial sector. Subsector performance for the years 2018 to 2022 is shown as a percentage of the inspections that received satisfactory ratings for the SCA. The total number of inspections conducted to assess performance in the SCA appears in parentheses. The number of inspections for the "Entire industrial sector" row is the aggregate for the entire sector, including subsectors not highlighted.

A breakdown by subsector is not provided for the security SCA, given the potentially sensitive information associated with that SCA.

Table 8: Management system – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the industrial sector and selected subsectors, 2018 to 2022

SCA	Subsector / sector	2018	2019	2020	2021	2022
Management system	Portable gauge	98% (321)	100% (215)	98% (92)	96% (171)	98% (207)
Management system	Fixed gauge	94% (112)	94% (124)	94% (94)	98% (64)	98% (91)
Management system	Industrial radiography	96% (138)	98% (114)	98% (66)	99% (82)	98% (108)
Management system	Oil-well logging	98% (43)	100% (24)	89% (9)	93% (15)	100% (23)
Management system	Entire industrial sector	97% (608)	98% (487)	96% (261)	97% (340)	98% (437)

Table 9: Operating performance – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the industrial sector and selected subsectors, 2018 to 2022

SCA	Subsector / sector	2018	2019	2020	2021	2022
Operating performance	Portable gauge	86% (326)	82% (216)	82% (98)	89% (192)	82% (210)
Operating performance	Fixed gauge	68% (111)	73% (124)	71% (94)	72% (64)	67% (91)
Operating performance	Industrial radiography	88% (138)	93% (114)	98% (66)	95% (82)	95% (107)
Operating performance	Oil-well logging	86% (44)	100% (24)	100% (9)	100% (14)	88% (24)
Operating performance	Entire industrial sector	83% (633)	84% (484)	82% (267)	88% (363)	83% (444)

The fixed gauge subsector continues to demonstrate low performance in the operating performance SCA. This finding has remained consistent over the last 5 years. The most frequent non-compliances in 2022 include failure to maintain appropriate worker records; failure of workers to ensure appropriate use of equipment, clothing and procedures onsite; and failure of workers to follow their obligations. Most of these non-compliances relate to licensees not following their established procedures, specifically in relation to internal audits, vessel entry, shutter checks and mounting/dismounting devices. CNSC staff continue to work with these licensees to correct items of non-compliance and to work on program deficiencies. CNSC staff used the DNSR Digest to circulate information on preparing for an inspection, including information on the use of internal inspections. CNSC staff have also engaged with licensees through specific outreach activities related to vessel entry procedures, as that was one area of declining performance. While staff continue to prioritize inspections for medium-risk licensees, such as those in the fixed gauge subsector, the current focus is on those licensees that are overdue for an inspection. Staff are satisfied with this prioritization, as most non-compliances are not serious in nature.

Table 10: Radiation protection – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the industrial sector and selected subsectors, 2018 to 2022

SCA	Subsector / sector	2018	2019	2020	2021	2022
Radiation protection	Portable gauge	84% (326)	74% (216)	83% (98)	81% (192)	71% (210)
Radiation protection	Fixed gauge	77% (111)	73% (124)	82% (94)	80% (64)	74% (91)
Radiation protection	Industrial radiography	91% (138)	92% (114)	86% (66)	93% (82)	89% (108)
Radiation protection	Oil-well logging	91% (44)	92% (24)	89% (9)	93% (14)	87% (23)
Radiation protection	Entire industrial sector	85% (633)	79% (483)	84% (267)	85% (364)	77% (444)

There has been an overall decrease in licensee performance in the radiation protection SCA across all subsectors, with a notable drop in performance in the fixed and portable gauge subsectors. The most frequent non-compliances in 2022 include failure to calibrate survey meters at the required frequency, failure of workers to ensure calibrated survey meters are available for use, and failure to post radiation warning signs that meet regulations. As mentioned previously, while staff continue to prioritize inspections for medium-risk licensees, such as those in the fixed and portable gauge subsectors, the current focus is on those licensees that are overdue for an inspection.

Table 11: Security – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the industrial sector, 2018 to 2022

SCA	Sector	2018	2019	2020	2021	2022
Security	Industrial sector	94% (624)	94% (484)	92% (122)	93% (167)	91% (369)

D.1.3 Academic and research sector

Tables 12 to 15 show the inspection performance of licensees in the academic and research sector. Subsector performance for the years 2018 to 2022 is shown as a percentage of the inspections that received satisfactory ratings for the SCA. The total number of inspections conducted to assess performance in the SCA appears in parentheses. The number of inspections for the "Entire academic and research sector" row is the aggregate for the entire sector, including subsectors not highlighted.

A breakdown by subsector is not provided for the security SCA, given the potentially sensitive information associated with that SCA.

Table 12: Management system – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the academic and research sector and 1 selected subsector, 2018 to 2022

SCA	Subsector / sector	2018	2019	2020	2021	2022
Management system	Laboratory studies and consolidated use	99% (84)	99% (74)	100% (9)	100% (16)	97% (32)
Management system	Entire academic and research sector	99% (86)	99% (74)	100% (9)	100% (18)	97% (34)

Table 13: Operating performance – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the academic and research sector and 1 selected subsector, 2018 to 2022

SCA	Subsector / sector	2018	2019	2020	2021	2022
Operating performance	Laboratory studies and consolidated use	88% (86)	95% (74)	89% (9)	94% (16)	100% (32)
Operating performance	Entire academic and research sector	88% (90)	95% (74)	90% (10)	96% (23)	97% (36)

Table 14: Radiation protection – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the academic and research sector and 1 selected subsector, 2018 to 2022

SCA	Subsector / sector	2018	2019	2020	2021	2022
Radiation protection	Laboratory studies and consolidated use	88% (86)	93% (74)	100% (10)	69% (16)	84% (32)
Radiation protection	Entire academic and research sector	88% (90)	93% (74)	100% (10)	78% (23)	83% (35)

Table 15: Security – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the academic and research sector, 2018 to 2022

SCA	Sector	2018	2019	2020	2021	2022
Security	Academic and research sector	79% (72)	99% (73)	100% (7)	91% (11)	87% (30)

D.1.4 Commercial sector

Table 16 shows the inspection performance of licensees in the commercial sector. The performance of the sector for the years 2018 to 2022 is shown as a percentage of the inspections that received satisfactory ratings for the SCA. The total number of inspections conducted to assess performance in the SCA appears in parentheses. The number of inspections for the commercial sector is the aggregate for the entire sector.

In light of the small number of inspections in each subsector, a breakdown by subsector is not provided. It would be difficult to identify trends in the subsectors given the low number of licensees in many of them.

Table 16: Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the commercial sector, 2018 to 2022

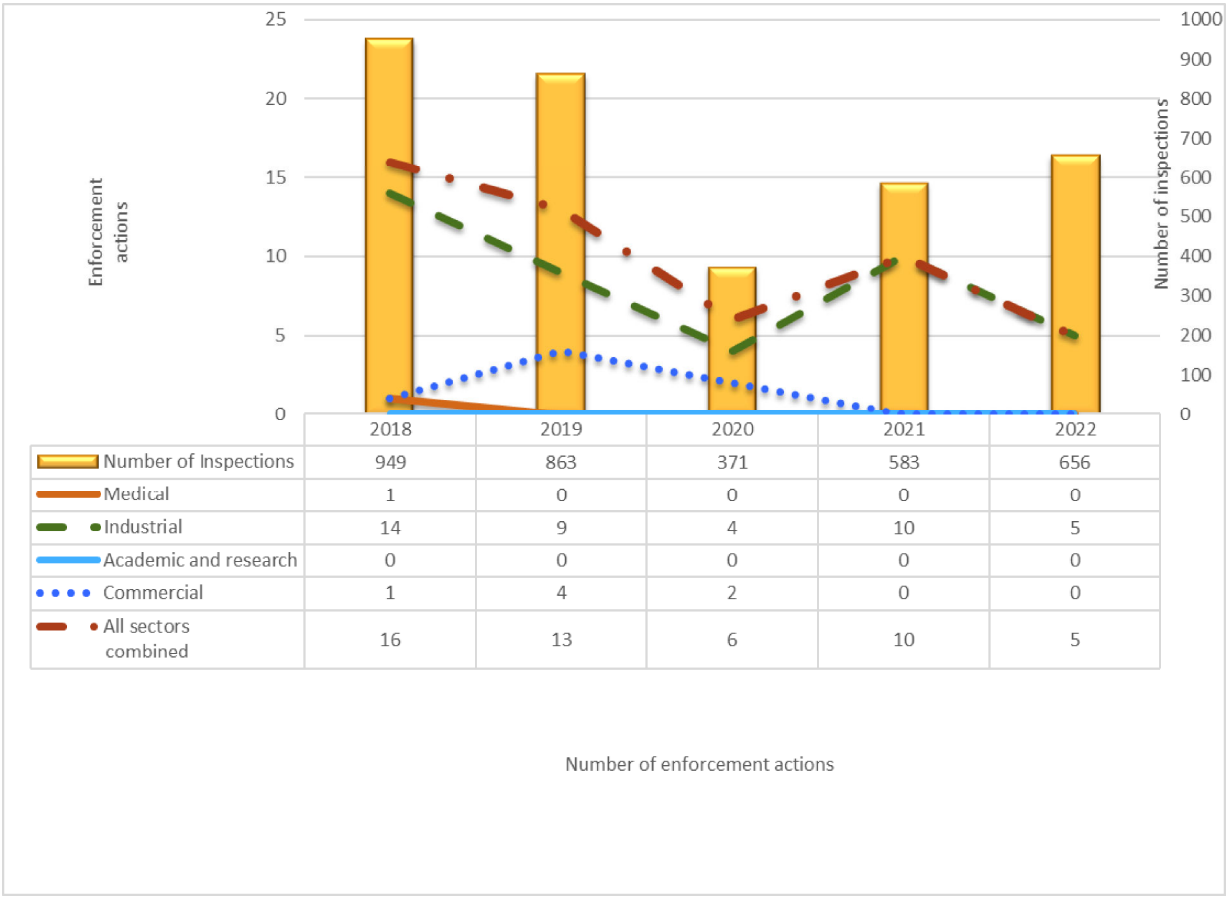
SCA	2018	2019	2020	2021	2022
Management system	97% (41)	97% (40)	100% (14)	92% (26)	94% (31)
Operating performance	92% (48)	89% (36)	94% (18)	87% (30)	91% (33)
Radiation protection	100% (46)	83% (48)	100% (21)	90% (29)	91% (33)
Security	93% (41)	91% (35)	90% (10)	100% (16)	100% (22)

Appendix E: Enforcement actions issued in 2022

In 2022, CNSC staff issued 5 orders and no administrative monetary penalties (AMPs) to licensees. All enforcement actions were issued to licensees in the industrial sector. This is consistent with previous years, in which most, if not all, enforcement actions were issued in that sector.

A complete list of orders issued is included in table 17. All enforcement actions issued have been closed, and the CNSC is satisfied that the licensees have addressed the conditions of the orders.

Figure 12: Sector-by-sector comparison of enforcement actions issued, 2018 to 2022



	2018	2019	2020	2021	2022
Number of Inspections	949	863	371	583	656
Medical	1	0	0	0	0
Industrial	14	9	4	10	5
Academic and research	0	0	0	0	0
Commercial	1	4	2	0	0
All sectors combined	16	13	6	10	5

Table 17: Orders issued in 2022

Date of issue	Order #	Licensee and location	Subsector / sector	Order summary	Status
August 11, 2022	1235	R.M. Bélanger Limited 100 Radisson Avenue, Chelmsford, ON	Portable gauge / industrial	The order was issued following a CNSC onsite inspection on August 11, 2022, in Chelmsford and Sudbury, Ontario. The inspection identified a number of non-compliances related to training requirements, record keeping, ascertainment of doses, radiation detection instrumentation availability, and compliance with the requirements of the *Transportation of Dangerous Goods Regulations* when transporting the radiation devices. The findings indicated that the licensee failed to implement a radiation protection program that included an adequate level of management oversight of work practices and personnel qualification and training. The order required the licensee to cease all use and transport of radiation devices and immediately place all gauges into secure storage until such time as the licensee had demonstrated to the satisfaction of the CNSC that an effective radiation protection program had been put in place and that all items of non-compliance identified in addendum 1 of the order had been corrected.	The licensee complied with the terms of the order to the satisfaction of the CNSC. The order was closed on January 13, 2023.
August 18, 2022	1142	JR's Salvage and Son Ltd. 56 Industrial Drive, Sussex, NB	X-ray fluorescence analysis / industrial	The order was issued because the licensee failed to submit a renewal application for the licence expiring on August 31, 2022. The order required the licensee to transfer all radiation devices in its possession to a licensee authorized by the CNSC to possess such devices and provide proof of the transfer via email by no later than August 31, 2022.	The licensee complied with the terms of the order to the satisfaction of the CNSC. The order was closed on July 25, 2023.

Date of issue	Order #	Licensee and location	Subsector / sector	Order summary	Status
August 30, 2022	0600	KCS Plastics Ltd. 5965 – 206 Street, Langley, BC	Fixed gauge / industrial	The order was issued on August 30, 2022, following a CNSC inspection at the licensee's facility in Langley, British Columbia. The inspection identified repeated items of non-compliance related to worker training, record of authorized workers, and survey meter availability/calibration. The order required the licensee to immediately cease all operations that involved the use of fixed nuclear gauges until such time as all items of non-compliance cited in the inspection report had been corrected and an effective radiation safety program had been implemented to the satisfaction of the CNSC.	The licensee complied with the terms of the order to the satisfaction of the CNSC. The order was closed on October 20, 2022.
October 25, 2022	1022	Aurora Inspections Limited 745048 Highway 2, Sexsmith, AB	Industrial radiography / industrial	The order was issued following a CNSC inspection on October 25, 2022, at the licensee's location in Sexsmith, Alberta. A review of dosimetry reports during the inspection identified that the licensee had failed to report to the CNSC that its monthly, quarterly and/or annual action level dose limits had been exceeded by multiple workers. In addition, the inspection revealed that the licensee had failed to implement sufficient management oversight of the radiation safety program and work practices to ensure that doses were kept as low as reasonably achievable. The order required the licensee to prohibit one of its workers from operating an exposure device until such time as the licensee had confirmed in writing to the CNSC that there was sufficient management control over work practices and that workers were sufficiently trained on dose control, demonstrating to the satisfaction of the CNSC that an effective radiation safety program was in place.	The licensee complied with the terms of the order to the satisfaction of the CNSC. The order was closed on November 25, 2022.

Date of issue	Order #	Licensee and location	Subsector / sector	Order summary	Status
November 17, 2022	0545	Labcan (1989) Ltée 175 Dessureault Street, Trois-Rivières, QC	Industrial radiography / industrial	The order was issued following a CNSC security inspection on November 17, 2022. The inspection identified non-compliances related to security requirements for transporting exposure devices in a vehicle. The order required the licensee to put in place adequate security measures for transporting an exposure device in a vehicle.	The licensee complied with the terms of the order to the satisfaction of the CNSC. The order was closed on January 13, 2023.

Appendix F: Doses to workers

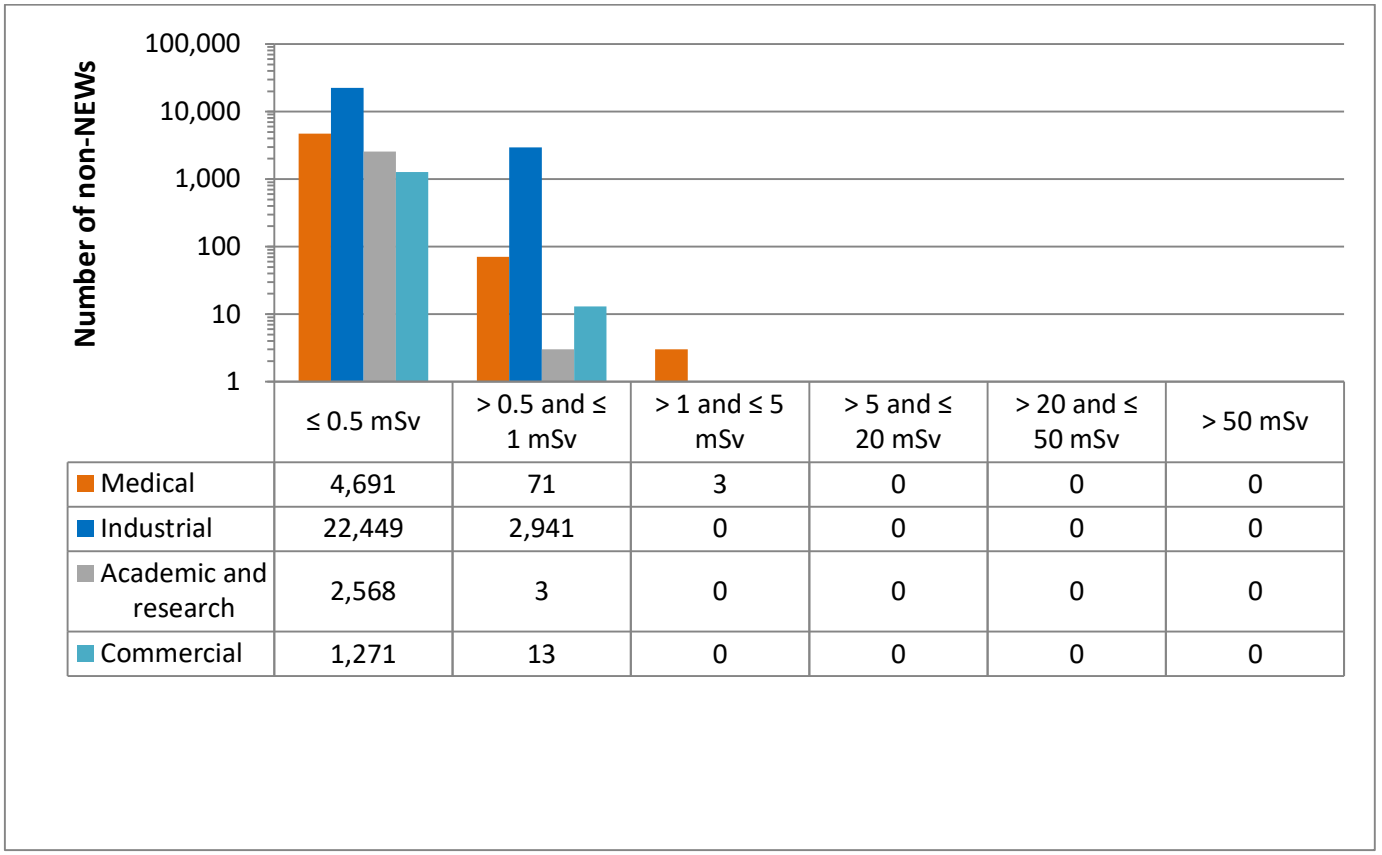
Occupational doses were reported by licensees for a total of 53,822 workers in the 4 sectors in 2022. Of those workers, 19,812 were nuclear energy workers (NEWs). The difference in doses to workers among sectors reflects the nature of the various activities within those sectors. Figure 13 shows the doses received by non-NEWs reported in 2022, with 91% reported as having received doses less than or equal to 0.5 mSv. Figure 14 shows the doses received by NEWs reported in 2022. Based on the reported doses for NEWs, only about 20% received a dose greater than 1 mSv, and less than 2% received a dose above 5 mSv. Figure 15 shows the doses to NEWs from 2018 to 2022.

As the figures demonstrate, doses overall have remained low and stable over the years. This is an indication that industry has successfully kept doses as low as reasonably achievable. Given the nature of the work performed in many cases, it is inevitable that some workers will receive a dose. The constancy year over year indicates that doses have likely achieved a state of equilibrium – changes in operational procedures will likely not yield any significant improvement in dose.

To further increase the granularity of dose reporting, CNSC staff have updated the annual compliance report forms to subdivide the 1–5 mSv category into 1–2 mSv and 2–5 mSv categories. Staff will consider how this data will be presented in future RORs.

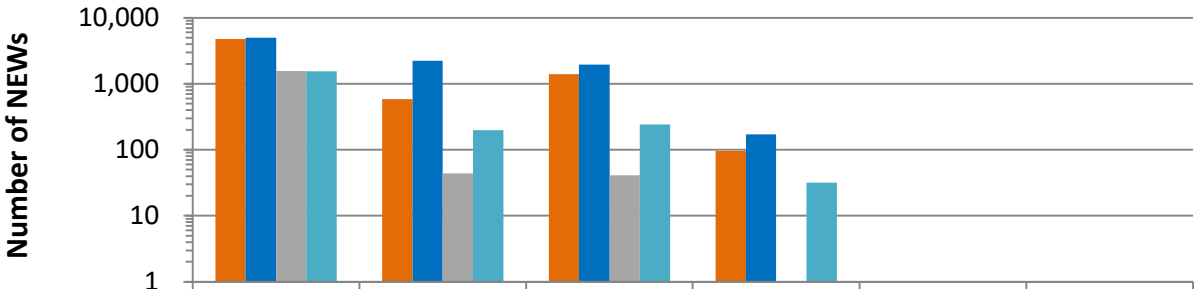
More information on doses is provided in section 5.0 of this report.

Figure 13: Sector-by-sector comparison of annual effective doses to all non-NEWs reported by licensees in 2022



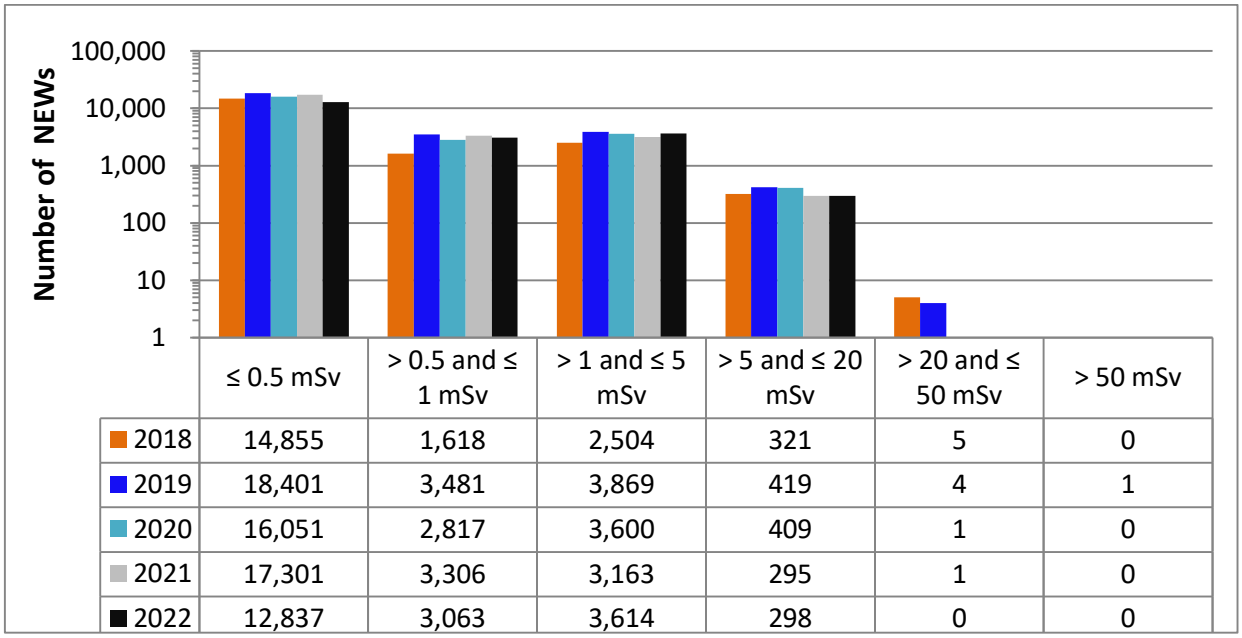
	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
Medical	4,691	71	3	0	0	0
Industrial	22,449	2,941	0	0	0	0
Academic and research	2,568	3	0	0	0	0
Commercial	1,271	13	0	0	0	0

Figure 14: Sector-by-sector comparison of annual effective doses to all NEWs reported by licensees in 2022



	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
Medical	4,752	588	1,392	96	0	0
Industrial	4,995	2,235	1,938	170	0	0
Academic and research	1,561	44	41	0	0	0
Commercial	1,529	196	243	32	0	0

Figure 15: Annual effective doses to NEWs, 2018 to 2022, all sectors combined

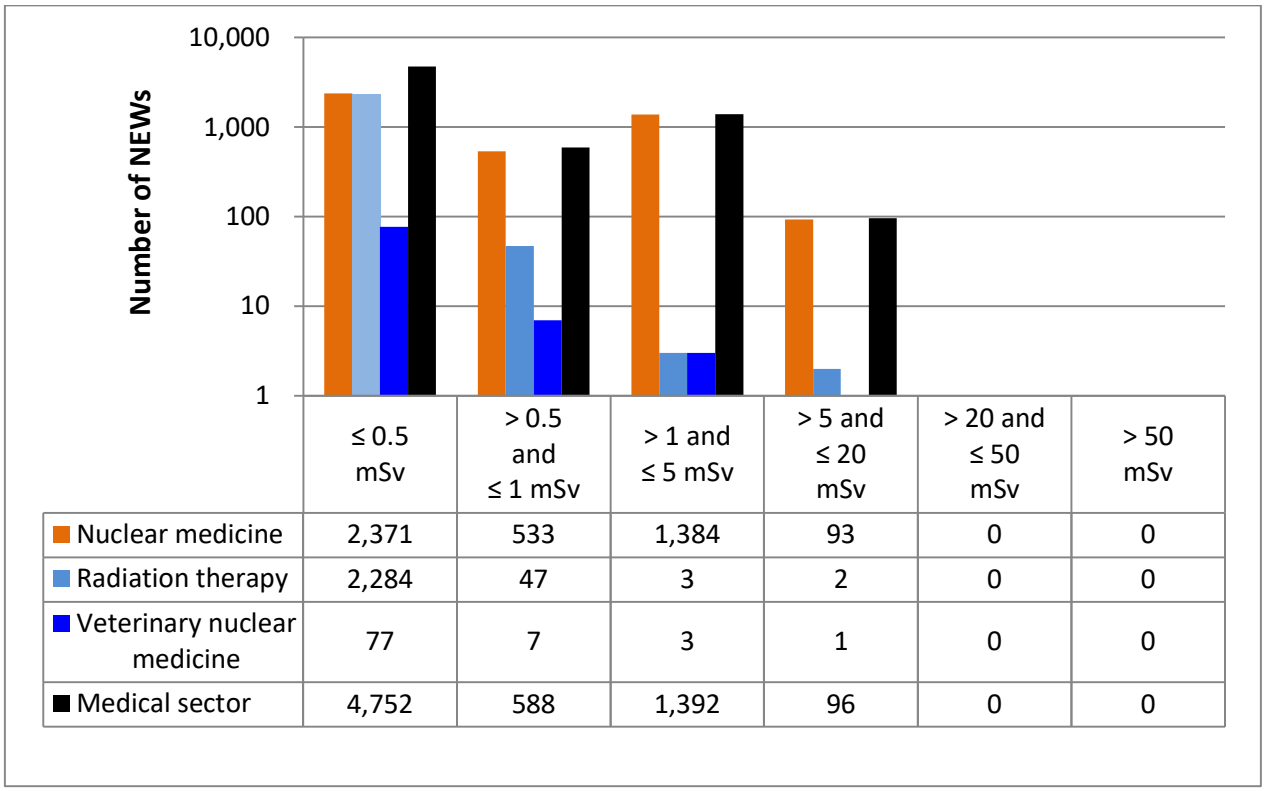


	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
2018	14,855	1,618	2,504	321	5	0
2019	18,401	3,481	3,869	419	4	1
2020	16,051	2,817	3,600	409	1	0
2021	17,301	3,306	3,163	295	1	0
2022	12,837	3,063	3,614	298	0	0

F.1 Medical sector

Figure 16 shows the doses received by NEWs in the medical sector, as reported to the CNSC for 2022. Note that the total number of NEWs shown in the "Medical sector" row is the aggregate for the entire sector, including subsectors not highlighted. Results are similar to past years.

Figure 16: Reported doses to NEWs in the medical sector (selected subsectors and entire sector), 2022

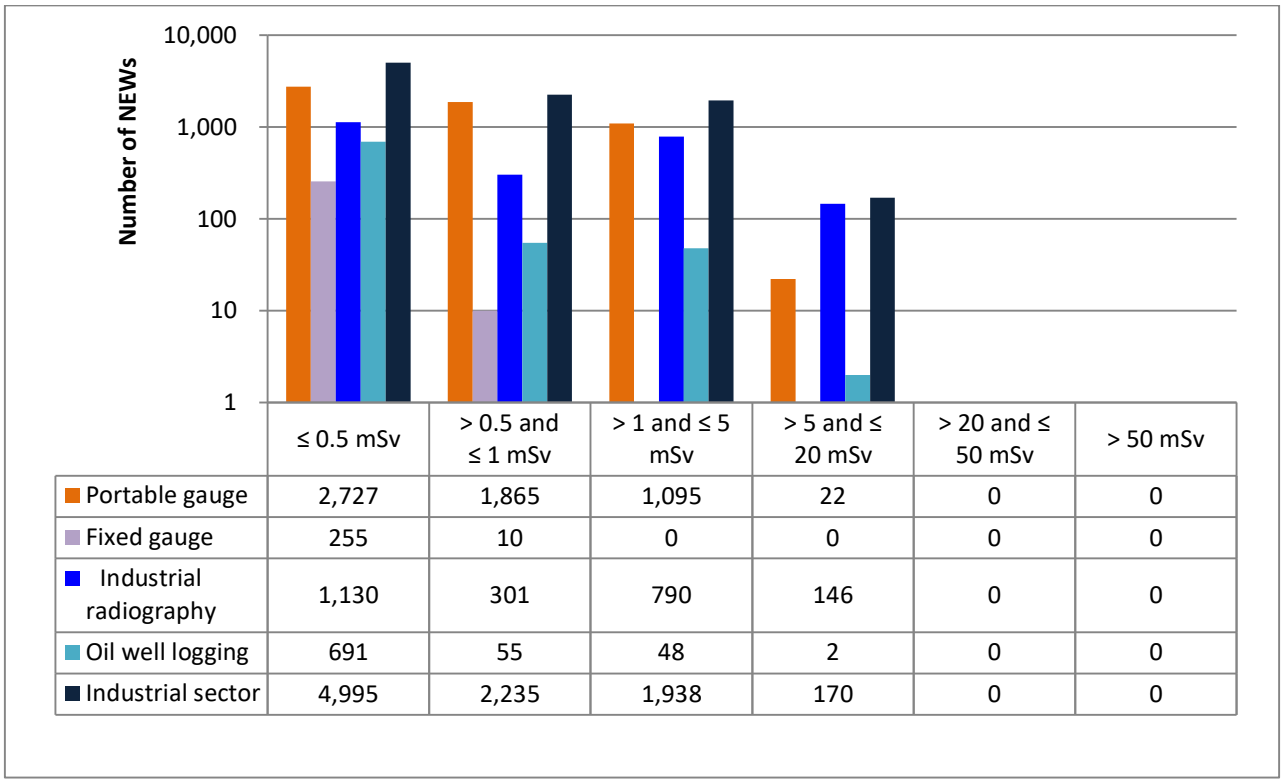


	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
Nuclear medicine	2,371	533	1,384	93	0	0
Radiation therapy	2,284	47	3	2	0	0
Veterinary nuclear medicine	77	7	3	1	0	0
Medical sector	4,752	588	1,392	96	0	0

F.2 Industrial sector

Figure 17 shows the doses received by NEWs in the industrial sector, as reported to the CNSC for 2022. Note that the total number of NEWs shown in the "Industrial sector" row is the aggregate for the entire sector, including subsectors not highlighted. Results are similar to past years.

Figure 17: Reported doses to NEWs in the industrial sector (selected subsectors and entire sector), 2022

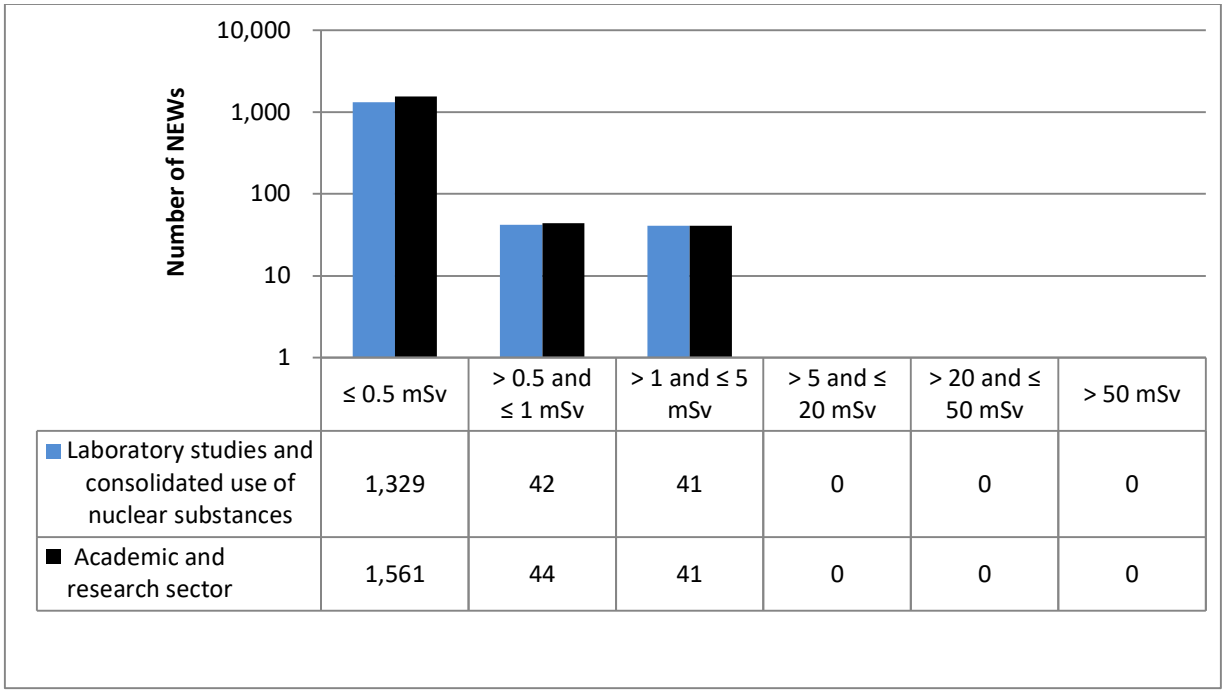


	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
Portable gauge	2,727	1,865	1,095	22	0	0
Fixed gauge	255	10	0	0	0	0
Industrial radiography	1,130	301	790	146	0	0
Oil well logging	691	55	48	2	0	0
Industrial sector	4,995	2,235	1,938	170	0	0

F.3 Academic and research sector

Figure 18 shows the doses received by NEWs in the academic and research sector, as reported to the CNSC for 2022. Note that the total number of NEWs shown in the "Academic and research sector" row is the aggregate for the entire sector, including subsectors not highlighted. Results are similar to past years.

Figure 18: Reported doses to NEWs in the academic and research sector (selected subsector and entire sector), 2022

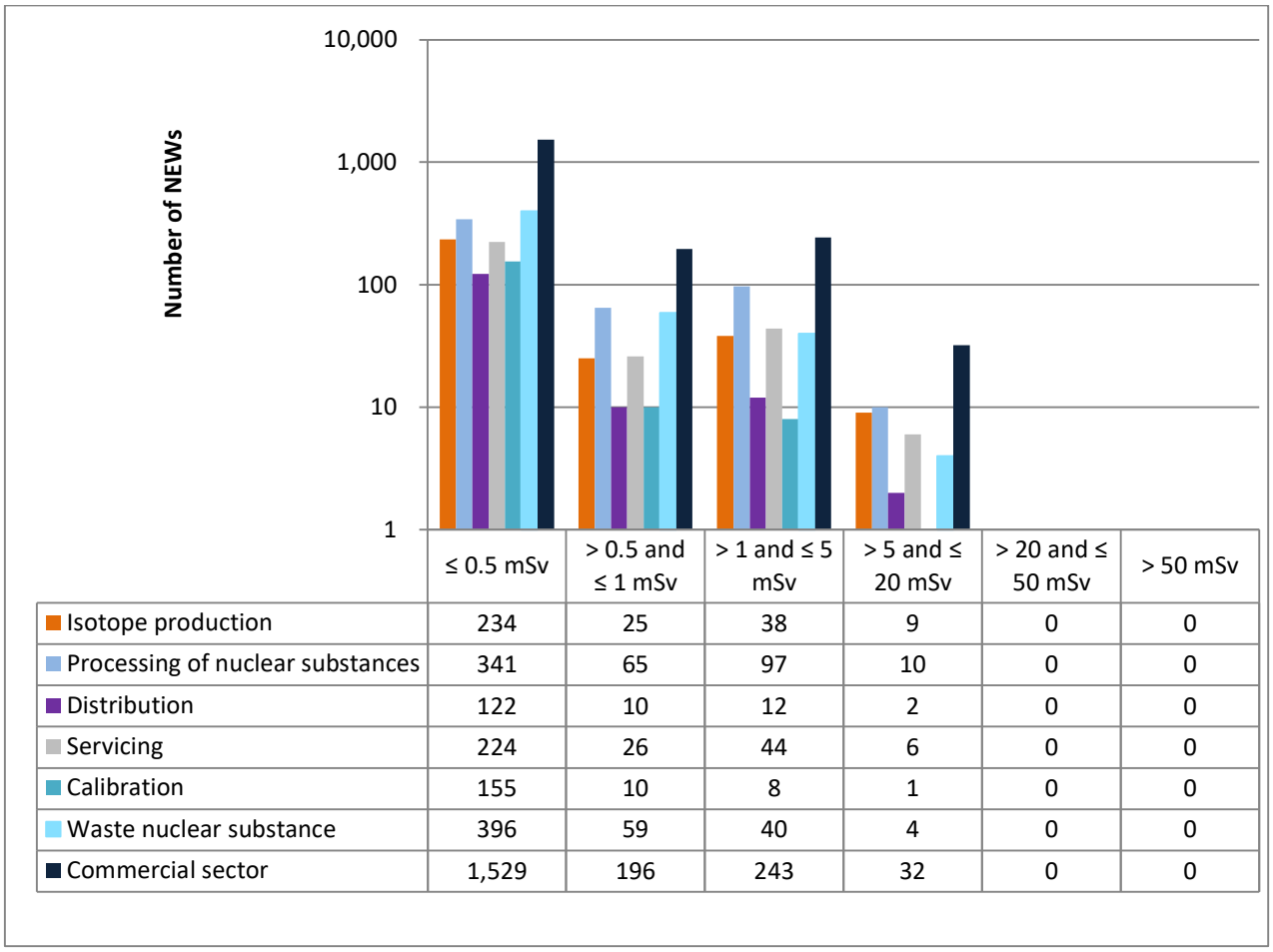


	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
Laboratory studies and consolidated use of nuclear substances	1,329	42	41	0	0	0
Academic and research sector	1,561	44	41	0	0	0

F.4 Commercial sector

Figure 19 shows the doses received by NEWs in the commercial sector, as reported to the CNSC for 2022. Note that the total number of NEWs shown in the "Commercial sector" row is the aggregate for the entire sector, including subsectors not highlighted. Results are similar to past years.

Figure 19: Reported doses to NEWs in the commercial sector (selected subsectors and entire sector), 2022

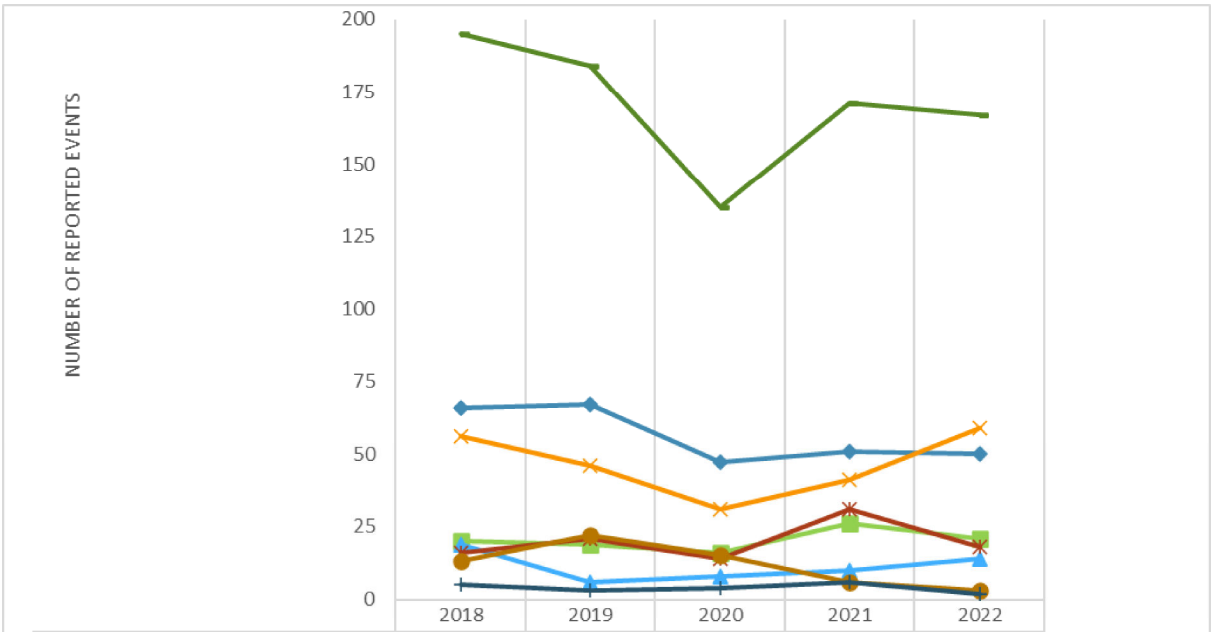


	≤ 0.5 mSv	> 0.5 and ≤ 1 mSv	> 1 and ≤ 5 mSv	> 5 and ≤ 20 mSv	> 20 and ≤ 50 mSv	> 50 mSv
Isotope production	234	25	38	9	0	0
Processing of nuclear substances	341	65	97	10	0	0
Distribution	122	10	12	2	0	0
Servicing	224	26	44	6	0	0
Calibration	155	10	8	1	0	0
Waste nuclear substance	396	59	40	4	0	0
Commercial sector	1,529	196	243	32	0	0

Appendix G: Reportable events

In 2022, CNSC staff received 206 notifications from licensees of potential events related to nuclear substances and prescribed equipment. Staff considered 167 of these to be reportable events. Notifications not considered reportable events may include such things as action level exceedances, successful fishing operations (well-logging), flooding where no nuclear substances or prescribed equipment have been affected, and potential work disruptions. Of the 167 reportable events, 164 were rated as level 0 (no safety significance) on the International Nuclear and Radiological Event Scale (INES) and 3 were rated as INES level 1 (anomaly). For all events reported, licensees implemented appropriate response measures to mitigate the impacts and to limit radiation exposure to workers and the public. CNSC staff reviewed the response measures and found them to be satisfactory. Figure 20 shows the 5-year trend for different types of events, tables 18 to 22 show event data by sector and subsector for each type of reportable event, and table 23 provides a summary of all reportable events. Additional information on reportable events is provided in section 6.0.

Figure 20: Reportable events from 2018 to 2022, all sectors combined



	2018	2019	2020	2021	2022
Malfunctioning or damaged devices	66	67	47	51	50
Spills, contamination or release	20	19	16	26	21
Lost, stolen, found or abandoned nuclear substances	19	6	8	10	14
Packaging and transport	56	46	31	41	59
Breach of security	16	21	14	31	18
Unplanned exposure	13	22	15	6	3
Other	5	3	4	6	2
All reported events	195	184	135	171	167

Note:

- All unplanned exposures in 2022 resulted from individuals crossing safety barriers while industrial radiography was occurring. None of these events resulted in any overexposures.
- Sources abandoned down a well due to unsuccessful fishing operations in the oil and gas industry are now included in the lost, stolen and found nuclear substances category.

In the following tables, the number of events in subsectors not highlighted is captured under “other”.

Table 18: Commercial sector reportable events in 2022

There was a total of 43 reportable events in the commercial sector.

Subsector	Malfunctioning or damaged devices	Spills, contamination or release	Lost, stolen, found or abandoned nuclear substances	Packaging and transport	Breach of security	Unplanned exposure	Other
Isotope production	4	3	0	6	0	0	0
Processing of nuclear substances	0	4	0	16	0	0	0
Distribution	0	0	0	0	0	0	0
Servicing	0	0	0	1	0	0	0
Calibration	0	0	0	0	0	0	0
Waste nuclear substance	0	2	0	3	1	0	2
Other	0	0	0	1	0	0	0

Table 19: Medical sector reportable events in 2022

There was a total of 31 reportable events in the medical sector:

Subsector	Malfunctioning or damaged devices	Spills, contamination or release	Lost, stolen, found or abandoned nuclear substances	Packaging and transport	Breach of security	Unplanned exposure	Other
Nuclear medicine	0	11	4	5	0	0	0
Radiation therapy	1	0	3	0	7	0	0
Veterinary nuclear medicine	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0

Table 20: Industrial sector reportable events in 2022

There was a total of 89 reportable events in the industrial sector:

Subsector	Malfunctioning or damaged devices	Spills, contamination or release	Lost, stolen, found or abandoned nuclear substances	Packaging and transport	Breach of security	Unplanned exposure	Other
Portable gauge	17	0	3	20	4	0	0
Fixed gauge	17	0	1	0	2	0	0
Industrial radiography	11	0	0	6	2	3	0
Oil-well logging	0	0	2	0	0	0	0
Other	0	0	1	0	0	0	0

Table 21: Academic and research sector reportable events in 2022

There was a total of 4 reportable events in the academic and research sector:

Subsector	Malfunctioning or damaged devices	Spills, contamination or release	Lost, stolen, found or abandoned nuclear substances	Packaging and transport	Breach of security	Unplanned exposure	Other
Laboratory studies and consolidated use	0	1	0	1	1	0	0
Other	0	0	0	0	1	0	0

Table 22: Reportable events in all sectors in 2022

There was a total of 167 reportable events in all sectors combined:

All sectors combined	Malfunctioning or damaged devices	Spills, contamination or release	Lost, stolen, found or abandoned nuclear substances	Packaging and transport	Breach of security	Unplanned exposure	Other
Total events	50	21	14	59	18	3	2

Table 23: Reportable events in 2022

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5446	January 5	0	Spill	Medical	Nuclear medicine	A spill >100 exemption quantities (EQ) of iodine-131 occurred. A nuclear energy worker (NEW) received minor skin contamination to the finger below reportable limits. The licensee amended its radiation safety manual to include thyroid screening between 1 and 3 hours post event and again at 24 hours.
5465	January 5	0	Breach of security	Medical	Radiation therapy	A restricted room was found to be accessible by unauthorized staff. Access records confirmed there was no unauthorized access. Corrective actions were put in place to prevent recurrence.
5447	January 6	0	Device malfunction	Industrial	Fixed gauge	The shutter of a fixed gauge was stuck in the open position. The gauge was dismounted and disposed of. There were no overexposures as a result of this event.
5450	January 6	1	Stolen device	Industrial	Portable gauge	A portable gauge in its Type A package was stolen along with other hand tools from a parked vehicle. The portable gauge was recovered but without its Type A transport package.
5452	January 17	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle transporting a Type A package containing fluorine-18 was involved in a motor vehicle accident (MVA). There was no damage to the package.
5454	January 18	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle transporting a Type A package containing technetium-99m was involved in an MVA. There was no damage to the package.
5457	January 20	0	Transport issue	Commercial	Other	A Type A package containing iodine-131 was damaged while in air transit. The Canadian airline refused the package, and it was returned to the country of origin.
5466	January 25	0	Transport issue	Commercial	Processing of nuclear substances	Contamination was detected on the exterior of a package upon receipt. There was no spread of the contamination, and no one was contaminated. Procedures were updated to ensure that the consignor is informed when a consignee receives a contaminated package.
5468	January 25	0	Breach of security	Medical	Radiation therapy	A power outage disabled the security alarm of a storage room. Security staff increased surveillance and visual

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
						checks on the storage room until the power was restored.
5479	January 26	0	Damaged device	Industrial	Industrial radiography	An exposure device was damaged when the handle became stuck in the tailgate of a truck. The source remained in its shielded position. The device was sent for repair and the worker was retrained. There were no overexposures as a result of this event.
5473	January 28	0	Abandoned device	Industrial	Oil-well logging	Two sealed sources (cesium-137 and americium-241) were stuck down a well. Fishing operations to recover the sources were not successful and the licensee requested permission to abandon the sources down the well. CNSC staff assessed and approved this request. There were no overexposures as a result of this event.
5474	January 31	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle transporting packages containing fluorine-18 was involved in an MVA. There was no damage to the packages.
5475	January 31	0	Transport issue	Academic and research	Laboratory studies and consolidated use	A package containing a molybdenum-99 generator was received with minor damages. The licensee took swipes and confirmed that there was no contamination. The consignor/carrier was notified.
5488	February 15	0	Lost substance	Medical	Radiation therapy	During a pathology protocol, a sealed source of iodine-125 was lost. The licensee searched the premises but could not recover the source and suspects that it was disposed of with other biomedical waste.
5492	February 16	0	Device malfunction	Industrial	Industrial radiography	An exposure device malfunctioned due to an issue with the Posilock. The source was able to be retracted into the shielded position. The device was sent for maintenance. There were no overexposures as a result of this event.
5493	February 18	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle transporting packages (empty and excepted) was involved in an MVA. There was no damage to the packages. The licensee reminded workers to adjust driving in poor weather conditions.
5495	February 18	0	Device malfunction	Industrial	Fixed gauge	A serious pipe leak occurred near a fixed gauge. While isolating the gauge, the shutter was found to be stuck in the open position. An external shield was applied, and the gauge was dismounted and re-installed after the leak was

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
						repaired. The licensee confirmed the shutter on the gauge was repaired.
5496	February 21	0	Device malfunction	Industrial	Fixed gauge	During an inspection, the inspector found a gauge with a shutter stuck in the open position due to corrosion. The gauge was removed and replaced by a spare gauge that was in storage. The licensee confirmed that the gauge was repaired by a licensed service provider.
5500	February 23	0	Transport – MVA	Industrial	Industrial radiography	A vehicle transporting an exposure device was involved in an MVA. There was no damage to the exposure device as a result of this event.
5499	February 24	0	Spill	Medical	Nuclear medicine	A spill >100 EQ of lutetium-177 occurred during an injection due to a leaking intravenous pump. The patient's arm was contaminated and cleaned. There was no other contamination to persons. Procedures have been put in place to check for leaks with saline prior to injecting the lutetium-177.
5502	March 2	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge.
5504	March 7	0	Abandoned device	Industrial	Other	An americium-241 source was stuck down a well. Fishing operations to recover the source were not successful and the licensee requested permission to abandon the source down the well. CNSC staff assessed and approved this request. There were no overexposures as a result of this event.
5506	March 8	0	Transport – MVA	Commercial	Isotope production	A vehicle transporting excepted packages (previously held fluorine-18) was involved in an MVA. The driver sustained minor injuries but there was no damage to the packages.
5507	March 9	0	Transport – MVA	Commercial	Isotope production	A vehicle carrying fluorine-18 was involved in a minor MVA. There was no damage to the package.
5511	March 10	0	Device malfunction	Industrial	Fixed gauge	When attempting to close the shutters on 2 gauges to take closed shutter readings, they remained stuck in the open position. To prevent recurrence, the licensee will open and close the shutter annually on each gauge. The licensee confirmed that both gauges were repaired by a licensed service provider.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5512	March 11	0	Transport – MVA	Commercial	Isotope production	A vehicle carrying 4 packages of fluorine-18 was involved in an MVA. There was no damage to the packages.
5515	March 16	0	Device malfunction	Industrial	Fixed gauge	A shutter was found to be stuck in the open position on a fixed gauge. A licensed service provider repaired the gauge. Preventive maintenance has been put in place to prevent recurrence.
5522	March 17	0	Spill	Medical	Nuclear medicine	A spill >100 EQ of fluorine-18 occurred when the patient administration set disconnected from the unit. There was no skin contamination and no overexposures as a result of this event. The licensee has modified its procedures to prevent recurrence.
5519	March 23	0	Breach of security	Medical	Radiation therapy	A treatment room was found unsecured with no authorized user present. This was a repeat event, and as a result, the CNSC performed a security inspection on the premises.
5521	March 25	0	Breach of security	Industrial	Industrial radiography	A darkroom truck was left running to generate power for the darkroom lab because the generator was shut down. The cab was unlocked and a worker was developing film while in the darkroom. An unknown contractor jumped in and moved the truck to make room for a trailer. The licensee put in place corrective measures to prevent recurrence.
5525	March 25	0	Spill	Medical	Nuclear medicine	A spill >100 EQ of fluorine-18 occurred when a patient administration set became partially disconnected from the unit. The licensee reminded staff to check the connection prior to administration. There was no skin contamination and no overexposures as a result of this event.
5527	March 26	0	Transport – MVA	Industrial	Industrial radiography	A vehicle transporting an exposure device was involved in an MVA. There was no damage to the exposure device and no injuries as a result of this event.
5526	March 28	0	Device malfunction	Industrial	Fixed gauge	The shutter of a fixed gauge was found to be stuck in the open position. The gauge was repaired by a licensed service provider.
5529	March 28	0	Damaged device	Industrial	Fixed gauge	The mounting support of a fixed gauge broke, and the gauge fell from height. The shutter was in a closed position at the time. A replacement gauge was installed and the gauge in question was

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
						put in storage. There were no unplanned exposures as a result of this event.
5533	March 28	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle carrying excepted packages was involved in an MVA. There was no damage to the packages and no injury to the driver.
5524	March 29	0	Lost substance	Medical	Radiation therapy	An iodine-125 seed was lost. After using a number of seeds for treatment, there was one seed less than expected remaining. The licensee searched the premises but could not recover the sealed source.
5532	March 29	0	Breach of security	Industrial	Portable gauge	The licensee left its vehicle at a client site and used it as an overnight storage location for a portable gauge. The vehicle was moved by an unauthorized worker to accommodate grading of the area. The licensee put in place corrective measures to prevent recurrence.
WNSL-1	March 29	0	Transport issue	Commercial	Waste nuclear substance	Two samples were shipped as an exempt shipment, but upon further analysis, it was found that they contained more than exemption quantities of cesium-137, cobalt-60 and americium-241. There were no significant doses to workers (less than 8.8 μSv).
5534	March 31	0	Spill	Commercial	Isotope production	A spill >100 EQ of fluorine-18 occurred when a vial was dropped. There was no skin contamination and no overexposures as a result of this event.
5537	April 5	0	Transport – MVA	Industrial	Portable gauge	A vehicle carrying 2 portable gauges was involved in an MVA. There was no damage to the gauges and no injuries to the driver.
5544	April 21	0	Damaged device	Industrial	Portable gauge	A portable gauge was run over by a truck on a construction site. The gauge was transported in its Type A package to a licensed service provider. There was no loss of containment and no overexposures as a result of this event.
5549	April 29	0	Transport issue	Medical	Nuclear medicine	An improperly prepared package was received. The dose rate at contact was higher than normal. The package, when opened, contained an unshielded medical isotope. The consignee informed the consignor. There were no overexposures as a result of this event.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
						The licensee put corrective measures in place to prevent recurrence.
5548	May 1	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle carrying 4 Type A packages was involved in a minor MVA. There was no damage to the packages and no injury to the driver.
5553	May 5	0	Spill	Commercial	Processing of nuclear substances	A spill >100 EQ of iodine-131 occurred when a vial fell on the floor and broke. No workers received a thyroid uptake, no workers were contaminated, and no environmental releases occurred as a result of this event. New equipment was installed to ensure that vials are closed properly.
5554	May 9	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle carrying a Type A package was involved in an MVA. There was no damage to the package and no injury to the driver.
5555	May 10	0	Device malfunction	Industrial	Industrial radiography	The source of an exposure device could not be returned into the camera. It was successfully retrieved. Actions were taken to prevent recurrence. The dose received as a result was below the licensee action level.
5562	May 18	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in a minor MVA. There was no damage to the portable gauge and no injury to the driver.
5565	May 18	0	Damaged device	Industrial	Portable gauge	A portable gauge was run over by a truck on a construction site. The gauge was transported in its Type A package to a licensed service provider. There was no loss of containment and no overexposures because of this event. The licensee implemented measures to prevent recurrence.
5567	May 19	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle carrying a Type A package was involved in an MVA. There was no damage to the package and no injury to the driver.
5568	May 20	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5569	May 24	0	Transport issue	Medical	Nuclear medicine	A Type A package containing a source of cobalt-57 was damaged in transit. Wipes were performed on the source and no contamination or leak was found.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5570	May 24	0	Device malfunction	Industrial	Fixed gauge	A fixed gauge source was not retracting fully into the holder. A licensed service provider noted it was not properly installed and was able to fix the issue. There were no overexposures as a result of this event.
5579	May 24	0	Breach of security	Academic and research	Other	The roof of a licensee's facility was damaged in a windstorm. The licensee's emergency plan was activated and ensured the safety and security of the building. Operations have resumed with no further actions required.
5585	May 24	0	Breach of security	Medical	Radiation therapy	A treatment room was found unsecured with no authorized user present. All nuclear substances were accounted for. This was a repeat event, and as a result, the CNSC performed a security inspection on the premises.
5571	May 25	0	Spill	Medical	Nuclear medicine	A spill >100 EQ of fluorine-18 occurred during the administration of a dose to a patient. There was no personal contamination and no overexposures as a result of this event.
5572	May 25	0	Device malfunction	Medical	Radiation therapy	The source in an irradiator was stuck and could not be returned to the shielded position. The unit was immediately removed from service, signage placed, and keys removed. The licensee is working with the manufacturer on a repair solution.
WNSL-2	May 30	0	Waste nuclear substance – labour disruption	Commercial	Waste nuclear substance	Unionized employees withdrew their services, causing a work stoppage. Qualified alternative resources were arranged to ensure that the safety and security of equipment and sources was maintained until the employees returned.
5583	June 1	0	Damaged device	Industrial	Portable gauge	A portable gauge was run over by a truck on a construction site. The gauge was transported in its Type A package to the licensee's office to be disposed of. There was no loss of containment and no overexposures as a result of this event.
5580	June 2	1	Stolen device	Industrial	Portable gauge	A portable gauge in its Type A package was stolen from a parked vehicle. The portable gauge has not been recovered. The licensee has amended its procedures for overnight gauge storage.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5588	June 7	0	Breach of security	Industrial	Portable gauge	A portable gauge was left unattended on a restricted-access work site. The source was in its shielded position. The gauge was secured in a trailer until the responsible technician could retrieve it. The licensee reminded the technician of the security measures.
5589	June 8	0	Transport – MVA	Commercial	Isotope production	A vehicle carrying 3 packages of fluorine-18 was involved in an MVA. There was no damage to the packages and no injury to the driver.
5593	June 8	0	Damaged device	Industrial	Portable gauge	The plastic casing on a portable gauge broke while removing it from its storage container. To prevent recurrence, the box was moved and a locking arm safeguard was installed. There was no damage to the source and no overexposures as a result of this event.
5603	June 8	0	Damaged device	Commercial	Isotope production	A fluorine-18 spill occurred during a production process. The spill was contained to a hot cell. An investigation concluded that a transfer line was loose. There were no overexposures, no environmental releases, and no contamination as a result of this event.
5594	June 10	0	Transport issue	Medical	Nuclear medicine	A package was not properly prepared before shipment: the labels were not displayed on the package and the documentation was missing with the shipment. The licensee investigated and implemented actions to prevent recurrence.
5599	June 16	0	Damaged device	Industrial	Industrial radiography	The source of an exposure device could not be returned into the camera due to a dent on the guide tube. The source was successfully retrieved. There were no overexposures as a result of this event. The exposure device was fully inspected before being returned to service and the licensee reviewed operations with the workers involved.
5600	June 16	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5604	June 21	0	Damaged device	Commercial	Isotope production	A fluorine-18 spill occurred during a production process. The spill was contained in a hot cell. There were no overexposures, no environmental releases, and no personal contamination as a result of this event.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5605	June 21	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5606	June 22	0	Damaged device	Industrial	Portable gauge	A portable gauge was run over by a bulldozer on a construction site. The gauge was removed from service and disposed of. The licensee implemented corrective actions to prevent recurrence. There was no loss of containment and no overexposures as a result of the event.
WNSL-3	June 22	0	Equipment malfunction	Commercial	Waste nuclear substance	Tritium effluent monitoring was not performed for a period of approximately 3 days due to a timer malfunction. When the system activated, the timers did not reset. These events had no measurable effect on the health and safety of staff or the public. Given the low release levels, dose to the public from the release is considered negligible.
5610	June 23	0	Device malfunction	Industrial	Fixed gauge	The rod on the device used to manipulate the source failed. A licensed service provider went onsite to repair the gauge. To prevent recurrence, the licensed service provider will visit annually to maintain the gauge.
5614	June 27	0	Damaged device	Industrial	Portable gauge	A portable gauge was run over on a construction site. The licensee provided additional training to the worker to prevent recurrence. There was no loss of containment and no overexposures as a result of the event.
5617	June 28	0	Spill	Medical	Nuclear medicine	A nuclear medicine technologist spilled technetium-99m on their hand and contaminated their extremity dosimeter. The dose to the hand was estimated to be 272 mSv (less than the regulatory limit) and a dose change request will be submitted by the licensee. The licensee has reminded staff of the importance of wearing gloves and is looking at opportunities to prevent recurrence.
WNSL-4	June 28	0	Breach of security	Commercial	Waste nuclear substance	The circumstances and corrective actions concerning this event involve protected and/or classified information; therefore, this event is considered confidential.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5618	July 4	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle carrying a Type A package was involved in an MVA. There was no damage to the package and no injury to the driver.
5625	July 4	0	Unplanned exposure (breach of barrier)	Industrial	Industrial radiography	An onsite security guard crossed the barrier at the time of a radiography exposure. A re-enactment estimated that the dose to the security guard was 0.00018 μSv. The licensee implemented actions to prevent recurrence.
5620	July 6	0	Damaged device	Industrial	Industrial radiography	During operation, a guide tube was dented, which impeded the sealed source assembly from reaching the fully extended position. The guide tube was taken out of service. No dose was received as a result of this situation.
5621	July 6	0	Damaged device	Industrial	Portable gauge	The outer housing of a portable gauge was damaged. The gauge was sent for repair. There was no loss of containment and no overexposures as a result of the event.
5629	July 6	0	Transport issue	Industrial	Portable gauge	A Type A package containing a portable gauge was damaged when the tailgate on the truck opened and the corner of the package scraped against the road. The package was not properly secured as per procedures. The gauge was sent for inspection and no damage was found. The licensee reminded its personnel of the importance of following procedures.
5628	July 8	0	Damaged device	Industrial	Portable gauge	The outer housing of a portable gauge was damaged. The gauge was sent for repair. There was no loss of containment and no overexposures as a result of the event. Corrective measures were put in place to prevent recurrence.
5633	July 14	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5634	July 15	0	Device malfunction	Commercial	Isotope production	A worker inhaled fluorine-18 during synthesis because procedures were not followed and a seal was missing on the vial. The dose was estimated to be 1 mSv, which is below the reporting threshold.
5637	July 15	0	Transport issue	Commercial	Servicing	A package was delivered in error to a non-licensee. The licensee picked up the package the same day and brought it back under regulatory control.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5638	July 15	0	Device malfunction	Industrial	Fixed gauge	The shutter on a fixed gauge was found to be stuck in the open position. A licensed service provider replaced the defective gauge. To prevent recurrence, all gauges will be protected against dust using a guard.
5772	July 15	0	Transport – MVA	Industrial	Industrial radiography	A vehicle transporting an exposure device was involved in an MVA. There was no damage to the exposure device and no injuries as a result of this event.
5674	July 21	0	Spill	Medical	Nuclear medicine	A nuclear medicine technologist's wrist was contaminated with fluorine-18 when a spill occurred while a patient was being injected. The maximum skin dose was estimated to be 57 mSv. A dose change request has been submitted to add the extremity dose. There were no overexposures as a result of this event.
5643	July 22	0	Unplanned exposure (breach of barrier)	Industrial	Industrial radiography	A site worker crossed the barrier during a radiography exposure. The dose received by the worker was estimated to be 0.023 mSv. The licensee implemented actions to prevent recurrence.
5645	July 27	0	Transport issue	Commercial	Processing of nuclear substances	A package containing a molybdenum-99 generator was received with significant water damage. The licensee took survey readings and confirmed that the readings were at normal levels. Swipes were completed and confirmed that there was no contamination. The licensee notified the consignor/carrier.
5657	August 3	0	Damaged device	Industrial	Industrial radiography	An exposure device was damaged when it fell from height while being lowered from a tower. The exposure device was removed from service and sent for repair. Corrective measures were put in place to prevent recurrence. There were no overexposures as a result of this event.
5653	August 9	0	Transport issue	Commercial	Processing of nuclear substances	A Type A package containing yttrium-90 suffered some damage. There was no loss of containment. The package was properly repackaged prior to being returned to the consignor.
5658	August 15	0	Breach of security	Industrial	Portable gauge	The licensee reported a security breach at one of its licensed locations. The licensee confirmed that all nuclear substances were accounted for, notified the local authorities, and implemented

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
						corrective actions to prevent recurrence.
5662	August 17	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5663	August 17	0	Transport – MVA	Industrial	Industrial radiography	A vehicle transporting an exposure device was involved in an MVA. There was no damage to the exposure device and no injuries as a result of this event.
5665	August 18	0	Transport issue	Industrial	Industrial radiography	The locking mechanism of a Type B package source changer was unable to fully move and lock the source in the changer. The pin was physically pushed to a locking position. There were no overexposures as a result of this event and no unusually high radiation levels were observed. The licensee contacted the source provider and received confirmation to return the package.
5667	August 19	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver. The licensee reviewed defensive driving principles with all technicians who transport gauges.
5671	August 29	0	Device malfunction	Industrial	Portable gauge	During an onsite inspection, the shutter of a portable gauge was stuck in the open position due to dried mud residue. The licensee cleaned the dirt and the shutter closed completely. There was no exposure as a result of this event.
WNSL-5	August 30	0	Transport issue	Commercial	Waste nuclear substance	While unpacking a shipment of empty low-level radioactive waste metal bins, it was discovered that one of the bins was not empty and had a contact dose rate of ~4 μSv/hr. The event had no impact on the public, staff, property or the environment.
5672	August 31	0	Damaged device	Industrial	Portable gauge	A portable gauge was run over by a truck on a construction site. The gauge was transported in its Type A package to a licensed service provider for repair, and workers were reminded to stay in line of sight of the gauge. There was no loss of containment and no overexposures as a result of this event.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5675	September 1	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5677	September 1	0	Spill	Commercial	Processing of nuclear substances	A spill >100 EQ of strontium-82 occurred. The spill was contained to the fume hood. There was no skin contamination and no overexposures as a result of this event.
5678	September 1	0	Damaged device	Industrial	Portable gauge	A portable gauge was run over by a truck on a construction site. The gauge was transported for disposal in a 45-gallon drum with shielded materials, and workers were retrained. There was no loss of containment and no overexposures as a result of this event.
5679	September 2	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5680	September 3	0	Damaged device	Industrial	Industrial radiography	An exposure device could not be returned into the camera due to a bad connection. The equipment was taken out of service and sent for full maintenance. There was no overexposure as a result of this event.
5687	September 8	0	Damaged device	Industrial	Fixed gauge	The source handle on a fixed gauge broke when the operator pulled on it. The source was in the shielded position and the shutter was closed. The damaged gauge was replaced and will be assessed by a licensed service for repair or disposal. There were no overexposures as a result of this event.
5685	September 9	0	Abandoned device	Industrial	Oil-well logging	Two sealed sources (cesium-137 and americium-241) were stuck down a well. Fishing operations to recover the sources were not successful, and the licensee requested permission to abandon the sources down the well. CNSC staff assessed and approved that request. There were no overexposures as a result of this event.
5690	September 9	1	Stolen device	Industrial	Portable gauge	A portable gauge was stolen from its Type A package in a parked vehicle. The portable gauge was recovered and returned to the licensee. The licensee implemented actions to prevent a recurrence.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5691	September 9	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5693	September 12	0	Damaged device	Industrial	Industrial radiography	The source of an exposure device could not be returned into the camera. The licensee followed its emergency procedures to reconnect the source. The equipment was taken out of service and sent for full maintenance. There were no overexposures as a result of this event.
5694	September 12	0	Damaged device	Industrial	Fixed gauge	The source handle on a fixed gauge broke. The shutter was in an open position. The gauge was repaired by a licensed service provider. To prevent recurrence, gauges will be covered with humidity-resistant paint and verified every 6 months. There were no overexposures as a result of this event.
5695	September 16	0	Transport issue	Medical	Nuclear medicine	The licensee received a package containing a broken vial of technetium-99m. The vial and contaminated pads were removed and placed in a bag for decay. No other contamination was detected. The licensee notified the provider and will investigate.
5696	September 16	0	Transport issue	Industrial	Portable gauge	A portable gauge was damaged during transport. The Type A package fell off the truck and was dragged along the road while still being held by the cable. The portable gauge was then ejected from the Type A package and ended up in the ditch. The handle, source holder and shutter were intact but the plastic around the portable gauge was damaged. The gauge was placed back into the Type A package and transported to the licensee's location. There was no loss of containment and no overexposure as a result of this event. The licensee implemented actions to prevent recurrence.
5697	September 19	0	Device malfunction	Industrial	Portable gauge	The shutter of a portable gauge was stuck in the open position as a result of daily checks not being performed. On discovery, corrective actions were taken to close the shutter. The licensee retrained the worker and ascertained the dose. There were no overexposures as a result of this event.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5704	September 21	0	Damaged device	Industrial	Fixed gauge	The weld holding a nuclear gauge to the base plate cracked due to vibration. The licensee locked the gauge (off position) and dismounted it from the production line. The fixed gauge was transferred to a licensed service provider for disposal. There were no overexposures as a result of this event.
5701	September 22	0	Breach of security	Medical	Radiation therapy	A treatment room was found unsecured with no authorized user present. All nuclear substances were accounted for. The licensee implemented corrective actions to prevent recurrence.
5703	September 22	0	Spill	Medical	Nuclear medicine	A spill >100 EQ of technetium-99m occurred. There was no personal contamination and no overexposures as a result of this event.
5706	September 23	0	Spill	Academic and research	Laboratory studies and consolidated use	A spill of fluorine-18 occurred during an injection. There was no personnel contamination and no overexposures as a result of this event. The worker was reminded to check the line before injecting.
5708	September 23	0	Breach of security	Industrial	Portable gauge	The licensee reported a security breach at one of its licensed locations. The licensee confirmed that all nuclear substances were accounted for, notified the local authorities, and implemented corrective actions to prevent recurrence.
WNSL-6	September 27	0	Transport issue	Commercial	Waste nuclear substance	A shipment of low-level radioactive waste was misclassified. The error was corrected, and an updated radioactive materials shipment record was sent. The event had no impact on the public, staff, property, or the environment.
5713	October 3	0	Damaged device	Industrial	Portable gauge	A portable gauge was damaged on a construction site. The gauge was transported in its Type A package and sent to a licensed service provider for repair. There was no loss of containment and no overexposure as a result of this event. Corrective measures were implemented to prevent recurrence.
5714	October 4	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5715	October 4	0	Damaged device	Industrial	Portable gauge	A portable gauge was damaged on a construction site. The gauge was transported in its Type A package and sent to a licensed service provider for

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
						repair. There was no loss of containment and no overexposure as a result of this event. Workers were reminded to stay in line of sight of the gauge.
5716	October 5	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5722	October 5	0	Lost substance	Medical	Nuclear medicine	During a pathology protocol, a sealed source of iodine-125 was lost. The licensee searched the premises but could not recover the source and suspects that it was disposed of with other biomedical waste. The licensee implemented actions to prevent recurrence.
5718	October 7	0	Damaged device	Industrial	Portable gauge	A portable gauge was damaged on a construction site. The gauge was transported in its Type A package to a licensed service provider for repair. There was no loss of containment and no overexposure as a result of this event. The licensee retrained the worker.
5724	October 7	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5720	October 11	0	Damaged device	Industrial	Portable gauge	A portable gauge was damaged on a construction site. The source rod was in the shielded position. The portable gauge was transported in its Type A package and sent to a licensed service provider for disposal. There was no loss of containment and no overexposure as a result of this event.
5723	October 13	0	Device malfunction	Industrial	Fixed gauge	A shutter on a fixed gauge was found to be stuck in the open position. A licensed service provider was contacted to replace the gauge. There were no overexposures as a result of this event.
5725	October 14	0	Transport – MVA	Industrial	Industrial radiography	A vehicle transporting an exposure device was involved in an MVA. There was no damage to the exposure device and no injury to the driver.
5727	October 18	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle carrying 3 Type A packages was involved in an MVA. There was no damage to the packages and no injury to the driver.
5731	October 19	0	Damaged device	Industrial	Portable gauge	A portable gauge was damaged by a roller on a construction site. The portable gauge was transported in its

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
						Type A package to a licensed service provider for disposal. There was no loss of containment and no overexposures as a result of this event.
5732	October 19	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5733	October 21	0	Lost substance	Medical	Radiation therapy	During a manual brachytherapy treatment, an iodine-125 sealed source was lost. The seed was inadvertently disposed of in the regular waste. The licensee implemented actions to prevent recurrence.
5737	October 24	0	Device malfunction	Industrial	Industrial radiography	An exposure device's lock did not automatically engage when the source was fully retracted. The lock was engaged manually. The exposure device was removed from service and sent to a licensed service provider. It was determined that the service provider had installed an older spring at the previous maintenance. The service provider took actions to prevent a recurrence.
5742	October 27	0	Spill	Commercial	Isotope production	Several NEWs were contaminated as a result of a >100 EQ fluorine-18 spill that occurred because of a degraded transfer line from the cyclotron. The maximum skin dose calculations were estimated at 1.64 mSv. The licensee implemented actions to prevent recurrence.
5747	October 27	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5743	November 2	0	Breach of security	Medical	Radiation therapy	A security system was found unarmed during a routine overnight security sweep. Security personnel armed the system. All nuclear substances were accounted for.
5744	November 2	0	Breach of security	Industrial	Fixed gauge	A cesium-137sealed source was received but was not stored appropriately. A few days later, the licensee found the source in the unsecured receiving area of the facility. It was secured in the appropriate storage room. There were no overexposures as a result of this event. Receiving staff were not aware of procedures for receiving radioactive sources. The licensee implemented

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
						corrective actions to prevent recurrence.
5746	November 2	0	Lost substance	Medical	Nuclear medicine	An iodine-125 seed was lost when being implanted in a patient. The licensee searched the room but could not recover the source. The licensee implemented actions to prevent recurrence.
5756	November 5	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle carrying a Type A package containing a molybdenum-99 generator was involved in an MVA. The exterior of the package suffered minor damage. There was no release of radioactive materials. The licensee implemented a mandatory break to prevent driver boredom and distraction.
5757	November 7	0	Transport – MVA	Commercial	Processing of nuclear substances	A vehicle transporting fluorine-18 was involved in an MVA. There was no damage to the package and no injury to the driver.
5766	November 7	0	Device malfunction	Industrial	Fixed gauge	While conducting a periodic inspection, the licensee discovered that the shutter arm of a fixed gauge was broken. The manufacturer replaced the broken shutter arm with a new one. There were no unplanned exposures as a result of this event.
5752	November 9	0	Contamination	Commercial	Isotope production	Three NEWs discovered gallium-68 contamination on their shoes and on the floor near one of the hot cells. There was no skin contamination, no overexposure and no release to the environment. The licensee concluded that the minor spill (<100 EQ) was due to the removal of the target capsule and the needles from the hot cell in a non-controlled manner. The licensee revised its procedure to prevent recurrence.
5754	November 10	0	Contamination	Medical	Nuclear medicine	A NEW received skin contamination with technetium-99m. The extremity dose to the left hand was estimated to be 152 mSv, which is below the regulatory limit of 500 mSv. The licensee provided reminders to NEWs on wearing protective equipment and responding to skin contamination events. In addition, the licensee developed a list of after-hours contacts.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5753	November 11	0	Transport issue	Commercial	Isotope production	Damage was noted on a returned, empty shipping container. There was no contamination detected. The licensee took the package out of service due to a lack of spare parts required for the repair.
5760	November 14	0	Spill	Medical	Nuclear medicine	A spill >100 EQ of technetium-99m occurred. No regulatory dose limits were exceeded for the NEW involved. The licensee implemented corrective actions to prevent recurrence.
5759	November 15	0	Damaged device	Industrial	Fixed gauge	The shutter mechanism of a fixed gauge was broken and was stuck in the open position. The licensee confirmed that there was no immediate threat of radiation exposure given the physical location of the radiation device. A licensed service provider was contacted for the transfer and removal. There were no overexposures as a result of this event.
5763	November 16	0	Lost substance	Medical	Nuclear medicine	Two iodine-125 seeds were lost following 2 separate surgical procedures. The licensee suspects they were thrown away with the disposable linens. The licensee implemented actions to prevent recurrence.
5767	November 16	0	Breach of security	Industrial	Industrial radiography	The licensee reported a security breach at its facility when an intruder broke in. Security protocols worked as planned and the vault containing the nuclear substances was not breached. All nuclear substances were accounted for. The licensee conducted a system audit and confirmed that the security system was in working order. Corrective actions have been taken.
5762	November 19	0	Contamination	Medical	Nuclear medicine	A NEW received skin contamination of iodine-131. Thyroid monitoring was performed and dose estimates to the skin calculated. There were no regulatory dose limits exceeded. The licensee provided reminders to staff on protocols when administering iodine-131 therapies.
5761	November 26	0	Transport issue	Commercial	Processing of nuclear substances	The exterior of a Type A package containing a molybdenum-99 generator was punctured by a forklift. The package was wiped and monitored for loose contamination prior to rehandling. Damage was limited to the exterior of the package.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5770	November 28	0	Breach of security	Academic and research	Laboratory studies and consolidated use	A security motion sensor was inadvertently disarmed when a security guard doing a routine check swiped their badge to enter the room but did not swipe out to rearm when exiting the room. All nuclear substances were accounted for. There was no exposure as a result of this event. The licensee implemented corrective actions to prevent recurrence.
5777	November 28	0	Device malfunction	Commercial	Isotope production	For several days, the external "beam on" light above a door in a restricted area was experiencing issues. There were no unplanned radiation exposures to workers as result of this malfunction. The licensee repaired the issue and reminded staff of timely event notification as required by regulation.
5773	November 30	0	Unplanned exposure (breach of barrier)	Industrial	Industrial radiography	As a result of poor weather conditions that led to poor visibility of barriers and warning signs, a contract worker drove through an industrial radiography barrier. The contract worker dose was estimated to be approximately 0.00005 mSv. The licensee implemented actions to prevent recurrence by using site obstacles and barrier ribbons prior to resuming exposures.
5775	November 30	0	Transport – MVA	Commercial	Isotope production	A vehicle carrying a Type A package containing a molybdenum-99 generator and 2 empty packages was involved in an MVA. There was no damage to the packages and no injury to the driver. The licensee issued reminders on safe driving protocols, especially when driving in the dark.
5776	December 1	0	Damaged device	Industrial	Industrial radiography	The handle of an exposure device cracked due to a fall from height. The exposure device was tagged out of service to undergo a full inspection and repairs. The licensee implemented corrective actions to prevent recurrence, including retraining the workers involved, conducting safety meetings with all staff, revising refresher training, and conducting field audits. There were no overexposures or injuries associated with this event.
WNSL-7	December 6	0	Release	Commercial	Waste nuclear substance	Personnel performing the required weekly filter change-out discovered that the particulate pump had malfunctioned, resulting in a

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
						particulate release to the environment. The release was below the weekly administrative and action levels. The impact to the public and personnel was assessed as negligible.
WNSL-8	December 6	0	Release	Commercial	Waste nuclear substance	A tank meant to be on the “recirculate” setting was instead set to “pump-out”. By the time the error was noticed, the tank was emptied of ~10,000 litres. The estimated radiological parameters were well below action levels. The pH value in the sample was below the acceptable municipal range, but the PCB value in the sample exceeded the Municipal Code limit. All other non-radiological parameters met the criteria specified in the Municipal Code. There were likely no adverse effects on the environment or on the health and safety of persons resulting from the situation.
5778	December 7	0	Breach of security	Medical	Radiation therapy	A security breach was reported and was rectified shortly after its discovery. All nuclear substances were accounted for. The licensee implemented corrective actions to prevent recurrence.
5779	December 7	0	Transport issue	Medical	Nuclear medicine	A package containing a molybdenum-99 generator was damaged on receipt, with the outer box showing minor tears. The inner packaging and the generator were intact. The licensee conducted surveys, and results were within normal levels. The licensee notified the carrier and the consignor.
5784	December 12	0	Lost substance	Medical	Nuclear medicine	A cobalt-57 sealed source (Category 5) that was in decay storage went missing. The licensee believes that the source was accidentally disposed of with regular waste. The source is likely still in its shielded case and the licensee has not been contacted by the landfill.
5789	December 12	0	Breach of security	Industrial	Fixed gauge	A fixed gauge was delivered to the wrong location, that of an unsecured warehouse owned by the carrier. The licensee transferred the gauge to a licensed service provider until it could be transported to the intended secure location. The licensee took actions to prevent recurrence and also notified the carrier, who did the same.

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
5781	December 13	0	Transport – MVA	Industrial	Portable gauge	A vehicle transporting a portable gauge was involved in an MVA. There was no damage to the portable gauge and no injury to the driver.
5783	December 14	0	Damaged device	Industrial	Industrial radiography	A connection tip broke when hooking up the drive cable to the exposure device. The exposure device was not in use at the time. The licensee removed the device from service to perform failure analysis, reviewed its training and maintenance program, and issued a safety bulletin. The failure analysis concluded that the fracture of the male connector tip occurred as a result of excessive force. There were no overexposures as a result of this event.
5782	December 16	0	Spill	Commercial	Processing of nuclear substances	A spill >100 EQ of iodine-131 occurred when transferring a vial to a waste bin. There was no skin contamination as a result of this event. The NEWs' thyroid uptake results were normal. The estimated dose received was 0.5 mSv. The event was the result of human error, and corrective actions were put in place to prevent recurrence.
5785	December 16	0	Damaged device	Industrial	Fixed gauge	A fixed gauge was hit by mobile equipment. The gauge's housing was not damaged; only the nameplate was peeled off. The licensee conducted a leak test, repaired the nameplate, and installed a protection barrier to prevent future occurrences.
5796	December 16	0	Found device	Industrial	Fixed gauge	A portal monitor detected a fixed gauge inside a load of scrap metal. The licensee holds a licence for the use of fixed gauges and also operates a scrap metal recycling plant. The gauge was slightly damaged but there was no loss of containment. A survey was conducted, with normal levels reported. The licensee–owner (not the one who found the gauge) of the gauge was contacted, and they hired a licensed service provider to remove the gauge from the scrap metal facility and send it to a long-term storage facility.
5790	December 24	0	Spill	Commercial	Processing of nuclear substances	A spill >100 EQ of technetium-99m occurred. There was no skin contamination. The maximum estimated dose as a result of this event was 1.5 mSv, which was below quarterly action levels. Corrective

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Event summary
						actions were put in place to prevent recurrence.

Appendix H: Inspections conducted in 2022

Table 24: Inspections conducted in 2022

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-01-06	Seymour Pacific Developments Ltd.	Calgary	AB	Industrial	Portable gauge
2022-01-10	Roke Technologies Ltd.	Calgary	AB	Industrial	Oil-well logging
2022-01-12	Davies Geotechnical Inc.	North Vancouver	BC	Industrial	Portable gauge
2022-01-13	Canadian Natural Resources Limited	Fort McMurray	AB	Industrial	Portable gauge
2022-01-13	Newcrest Red Chris Mining Limited	Iskut	BC	Industrial	Portable gauge
2022-01-17	Uni-Tech Inspection Services Ltd.	South Glengarry	ON	Industrial	Industrial radiography
2022-01-18	PNW Testing & Consulting Inc.	Vancouver	BC	Industrial	Portable gauge
2022-01-18	Mistras Services Inc.	Sherbrooke	QC	Industrial	Industrial radiography
2022-01-18	Synthèse AptoChem Inc.	Montréal	QC	Academic and research	Laboratory studies and consolidated use
2022-01-19	Les Textiles Coraltex Inc.	Berthierville	QC	Industrial	Fixed gauge
2022-01-19	Bonnetts Energy Corp.	Red Deer	AB	Industrial	Oil-well logging
2022-01-19	Bonnetts Energy Corp.	Grande Prairie	AB	Industrial	Oil-well logging
2022-01-20	Hôpital Shriners pour enfants / Shriners Hospital for Children	Montréal	QC	Academic and research	Laboratory studies and consolidated use
2022-01-26	G&S Consultants	Chateauguay	QC	Industrial	Portable gauge
2022-01-26	Construction & Expertise PG Inc.	Beauharnois	QC	Industrial	Portable gauge
2022-01-26	Sunshine Coast Materials Testing Ltd.	Sechelt	BC	Industrial	Portable gauge
2022-01-26	Crosslink Leaseholds Inc.	Grande Prairie	AB	Industrial	Portable gauge
2022-01-26	Evraz North America	Regina	SK	Industrial	Fixed gauge
2022-01-27	Cave Inspection Ltd.	Cold Lake	AB	Industrial	Industrial radiography
2022-01-27	Imperial Oil Limited / Compagnie Pétrolière Impériale Ltée	Winnipeg	MB	Industrial	Fixed gauge
2022-01-27	Imperial Oil Limited / Compagnie Pétrolière Impériale Ltée	Gretna	MB	Industrial	Fixed gauge
2022-01-27	Imperial Oil Limited / Compagnie Pétrolière Impériale Ltée	East St. Paul	MB	Industrial	Fixed gauge
2022-01-27	Université de Montréal	St-Hyacinthe	QC	Medical	Veterinary nuclear medicine
2022-01-28	Kontzamanis, Graumann, Smith MacMillan Inc.	Winnipeg	MB	Industrial	Portable gauge
2022-02-01	Slick Inspection Limited	Medicine Hat	AB	Industrial	Industrial radiography
2022-02-02	Ville de Montréal	Montréal	QC	Industrial	Portable gauge
2022-02-02	Polyfilm Extrusions Ltd.	Montréal	QC	Industrial	Fixed gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-02-02	DPL Science Inc.	St-Lazare	QC	Academic and research	Other
2022-02-03	FPInnovations	Pointe-Claire	QC	Academic and research	Laboratory studies and consolidated use
2022-02-03	FPInnovations	Pointe-Claire	QC	Industrial	Fixed gauge
2022-02-03	Alberta Health Services	Edmonton	AB	Medical	Other
2022-02-07	Maple Leaf Construction Ltd.	Winnipeg	MB	Industrial	Portable gauge
2022-02-08	Nasiruddin Engineering Limited	Mississauga	ON	Industrial	Portable gauge
2022-02-08	Torngats Services Techniques Inc. / Torngats Technical Services Inc.	Québec	QC	Industrial	Industrial radiography
2022-02-09	Bailey Metal Processing Ltd.	Burlington	ON	Industrial	Fixed gauge
2022-02-10	Englobe Corp.	St-Jérôme	QC	Industrial	Portable gauge
2022-02-10	Insite Materials Testing Group Ltd.	Kelowna	BC	Industrial	Portable gauge
2022-02-10	Peto MacCallum Ltd.	Hamilton	ON	Industrial	Portable gauge
2022-02-10	Canada Border Services Agency	Dartmouth	NS	Industrial	Fixed gauge
2022-02-11	Georgian Imaging Incorporated	Innisfil	ON	Medical	Nuclear medicine
2022-02-14	Peterson Contracting Ltd.	Williams Lake	BC	Industrial	Portable gauge
2022-02-14	Barrie MacKay Contracting Ltd.	Cranbrook	BC	Industrial	Portable gauge
2022-02-15	Cody Last	Arras	BC	Industrial	Portable gauge
2022-02-16	Les Emballages Winpak Heat Seal Inc.	Vaudreuil-Dorion	QC	Industrial	Fixed gauge
2022-02-18	Gerdau AmeriSteel Corporation	Whitby	ON	Industrial	Fixed gauge
2022-02-21	Centre hospitalier de l'Université de Montréal	Montréal	QC	Medical	Radiation therapy
2022-02-21	Sintra Inc.	Lévis	QC	Industrial	Portable gauge
2022-02-21	Resolute FP Canada Inc. / PF Résolu Canada Inc.	Gatineau	QC	Industrial	Fixed gauge
2022-02-22	West Carleton Sand & Gravel Inc.	Carp	ON	Industrial	Portable gauge
2022-02-22	Englobe Corp.	Québec	QC	Industrial	Portable gauge
2022-02-22	Nylene Canada Inc.	Arnprior	ON	Industrial	Fixed gauge
2022-02-22	Transcontinental Packaging Whitby ULC	Whitby	ON	Industrial	Fixed gauge
2022-02-22	Bathurst Lawrence Nuclear Imaging Inc.	Toronto	ON	Medical	Nuclear medicine
2022-02-22	CHU de Québec – Université Laval	Sainte-Foy	QC	Medical	Nuclear medicine
2022-02-22	CHU de Québec – Université Laval	Sainte-Foy	QC	Medical	Nuclear medicine
2022-02-23	Groupe ABS Inc.	Québec	QC	Industrial	Portable gauge
2022-02-23	Louis W. Bray Construction Limited	Vars	ON	Industrial	Portable gauge
2022-02-23	Wood Canada Limited / Wood Canada Limitée	Nepean	ON	Industrial	Portable gauge
2022-02-23	CHU de Québec – Université Laval	Québec	QC	Medical	Nuclear medicine

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-02-23	CHU de Québec – Université Laval	Québec	QC	Medical	Nuclear medicine
2022-02-24	City of Regina	Regina	SK	Industrial	Portable gauge
2022-02-24	Morey Associates Limited	Kemptville	ON	Industrial	Portable gauge
2022-02-24	Torngats Services Techniques Inc. / Torngats Technical Services Inc.	Québec	QC	Industrial	Industrial radiography
2022-02-24	Maple Lodge Farms Ltd.	Brampton	ON	Industrial	Fixed gauge
2022-02-24	CHU de Québec – Université Laval	Québec	QC	Medical	Nuclear medicine
2022-02-24	Pylon Electronics Inc.	Ottawa	ON	Commercial	Other
2022-02-24	CHU de Québec – Université Laval	Québec	QC	Medical	Nuclear medicine
2022-02-25	C.T. Soil & Materials Testing Inc.	London	ON	Industrial	Portable gauge
2022-02-25	Institut universitaire de cardiologie et de pneumologie de Québec	Sainte-Foy	QC	Medical	Nuclear medicine
2022-02-25	Institut universitaire de cardiologie et de pneumologie de Québec	Sainte-Foy	QC	Medical	Nuclear medicine
2022-02-28	Baker Hughes Canada Company	Leduc	AB	Industrial	Oil-well logging
2022-02-28	SurvCon Geomatics Inc.	Saskatoon	SK	Industrial	Portable gauge
2022-02-28	IRISNDT Corp.	Nisku	AB	Industrial	Industrial radiography
2022-02-28	Iogen Corporation	Ottawa	ON	Industrial	Fixed gauge
2022-02-28	Heico 2004 Member, Inc.	L'Orignal	ON	Industrial	Fixed gauge
2022-02-28	Baker Hughes Canada Company	Leduc	AB	Industrial	Oil-well logging
2022-02-28	Stuart Hunt & Associates Ltd.	Edmonton	AB	Commercial	Distribution
2022-03-01	PCL Construction Management Inc.	Edmonton	AB	Industrial	Portable gauge
2022-03-01	McElhanney Ltd.	Edmonton	AB	Industrial	Portable gauge
2022-03-01	Nortech Advanced NDT Ltd.	Edmonton	AB	Industrial	Industrial radiography
2022-03-01	Vision Integrity Engineering Ltd.	Medicine Hat	AB	Industrial	Industrial radiography
2022-03-01	Halliburton Canada ULC	Nisku	AB	Industrial	Oil-well logging
2022-03-01	Centre intégré de santé et de services sociaux de l'Outaouais	Gatineau	QC	Medical	Nuclear medicine
2022-03-01	Centre intégré de santé et de services sociaux de l'Outaouais	Gatineau	QC	Medical	Nuclear medicine
2022-03-01	Centre intégré de santé et de services sociaux de l'Outaouais	Gatineau	QC	Medical	Nuclear medicine
2022-03-01	Centre intégré de santé et de services sociaux de l'Outaouais	Gatineau	QC	Medical	Nuclear medicine
2022-03-01	Nortech Advanced NDT Ltd.	Edmonton	AB	Industrial	Calibration
2022-03-02	WSP Canada Inc.	Ottawa	ON	Industrial	Portable gauge
2022-03-02	Paterson Group Inc.	Ottawa	ON	Industrial	Portable gauge
2022-03-02	RTD Quality Services Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-03-02	Rivest Technologies Incorporated	Edmonton	AB	Industrial	Industrial radiography

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-03-02	Rivest Technologies Incorporated	Edmonton	AB	Industrial	Industrial radiography
2022-03-02	Nortech Advanced NDT Ltd.	Edmonton	AB	Industrial	Industrial radiography
2022-03-02	ADM Agri-Industries Company	Lloydminster	AB	Industrial	Fixed gauge
2022-03-02	Weatherford Canada Ltd.	Lloydminster	SK	Industrial	Oil-well logging
2022-03-02	RTD Quality Services Inc.	Edmonton	AB	Industrial	Calibration
2022-03-03	McIntosh Perry Limited	Nepean	ON	Industrial	Portable gauge
2022-03-03	TriQuest Nondestructive Testing Corp.	Edmonton	AB	Industrial	Industrial radiography
2022-03-03	TriQuest Nondestructive Testing Corp.	Edmonton	AB	Industrial	Industrial radiography
2022-03-03	Tweed Inc.	Smiths Falls	ON	Industrial	Fixed gauge
2022-03-03	Weatherford Canada Ltd.	Edmonton	AB	Industrial	Oil-well logging
2022-03-03	Weatherford Canada Ltd.	Edmonton	AB	Industrial	Oil-well logging
2022-03-03	TriQuest Nondestructive Testing Corp.	Edmonton	AB	Industrial	Calibration
2022-03-04	IRISNDT Corp.	Nisku	AB	Industrial	Industrial radiography
2022-03-04	IKO Industries Ltd.	Hawkesbury	ON	Industrial	Fixed gauge
2022-03-04	Collective Arts Limited	Hamilton	ON	Industrial	Fixed gauge
2022-03-08	EnergySolutions Canada	Brampton and Concord	ON	Commercial	Waste nuclear substance
2022-03-09	Maskwa Engineering Ltd.	Hay River	NT	Industrial	Portable gauge
2022-03-09	St. Joseph's Hospital	Hamilton	ON	Academic and research	Laboratory studies and consolidated use
2022-03-09	St. Joseph's Hospital	Hamilton	ON	Medical	Nuclear medicine
2022-03-09	St. Joseph's Hospital	Hamilton	ON	Medical	Nuclear medicine
2022-03-09	St. Joseph's Hospital	Hamilton	ON	Medical	Nuclear medicine
2022-03-09	St. Joseph's Hospital	Hamilton	ON	Medical	Nuclear medicine
2022-03-09	St. Joseph's Hospital	Hamilton	ON	Medical	Nuclear medicine
2022-03-09	St. Joseph's Hospital	Hamilton	ON	Medical	Nuclear medicine
2022-03-11	G. Tackaberry & Sons Construction Company Limited	Athens	ON	Industrial	Portable gauge
2022-03-11	Stantec Consulting Ltd.	Waterloo	ON	Industrial	Portable gauge
2022-03-11	Bay Cardiac Diagnostic Inc.	Toronto	ON	Medical	Nuclear medicine
2022-03-14	Jim Dent Construction Ltd.	Hope	BC	Industrial	Portable gauge
2022-03-15	Kamit Group Ltd.	Edmonton	AB	Industrial	Portable gauge
2022-03-15	BakosNDT Ltd.	Edmonton	AB	Industrial	Industrial radiography
2022-03-15	Kamit Group Ltd.	Edmonton	AB	Industrial	Industrial radiography
2022-03-15	Woodstock General Hospital	Woodstock	ON	Medical	Nuclear medicine
2022-03-16	Wright Quality Services Inc.	Edmonton	AB	Industrial	Industrial radiography

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-03-17	Clear Image Inspection Ltd.	Bentley	AB	Industrial	Industrial radiography
2022-03-17	Atomic NDT Ltd.	Rocky Mountain House	AB	Industrial	Industrial radiography
2022-03-17	Atomic NDT Ltd.	Sylvan Lake	AB	Industrial	Industrial radiography
2022-03-18	Fermar Asphalt Limited	Rexdale	ON	Industrial	Portable gauge
2022-03-18	WAV Inspection Ltd.	Brooks	AB	Industrial	Industrial radiography
2022-03-18	IKO Industries Ltd.	Brampton	ON	Industrial	Fixed gauge
2022-03-22	Bruce Power Inc.	Tiverton	ON	Industrial	Other
2022-03-22	Owens Corning InterWrap Canada GP Inc.	Mission	BC	Industrial	Fixed gauge
2022-03-23	Canada Border Services Agency / Agence des services frontaliers du Canada	Ottawa	ON	Industrial	Other
2022-03-23	Canada Border Services Agency / Agence des services frontaliers du Canada	Surrey	BC	Industrial	Other
2022-03-23	J.L. Shepherd and Associates	San Fernando	CA	Commercial	Servicing
2022-03-23	2956900 Canada Inc.	Chelsea	QC	Industrial	Portable gauge
2022-03-23	Outcome Consultants Inc.	Ottawa	ON	Industrial	Portable gauge
2022-03-23	Civil North Consulting Ltd.	Prince George	BC	Industrial	Portable gauge
2022-03-23	NUCM Associates Inc.	Oakville	ON	Commercial	Processing of nuclear substances
2022-03-24	Canada Border Services Agency / Agence des services frontaliers du Canada	Delta	BC	Industrial	Other
2022-03-28	Centre intégré de santé et de services sociaux de l'Outaouais	Gatineau	QC	Medical	Radiation therapy
2022-03-28	Alberta Health Services	Edmonton	AB	Medical	Nuclear medicine
2022-03-28	BC Cancer – Kelowna	Kelowna	BC	Medical	Nuclear medicine
2022-03-28	Alberta Health Services	Edmonton	AB	Medical	Nuclear medicine
2022-03-28	Alberta Health Services	Edmonton	AB	Medical	Nuclear medicine
2022-03-29	Alberta Health Services	Edmonton	AB	Academic and research	Laboratory studies and consolidated use
2022-03-29	Express Pipeline Ltd.	Hardisty	AB	Industrial	Fixed gauge
2022-03-29	Waterloo Brewing Ltd.	Kitchener	ON	Industrial	Fixed gauge
2022-03-29	Enbridge Employee Services Canada Inc.	Hardisty	AB	Industrial	Fixed gauge
2022-03-29	Enbridge Employee Services Canada Inc.	Hardisty	AB	Industrial	Fixed gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-03-29	Alberta Health Services	Edmonton	AB	Commercial	Processing of nuclear substances
2022-03-29	Provincial Health Services Authority	Vancouver	BC	Medical	Nuclear medicine
2022-03-29	Provincial Health Services Authority	Vancouver	BC	Medical	Nuclear medicine
2022-03-29	Provincial Health Services Authority	Vancouver	BC	Medical	Nuclear medicine
2022-03-29	Provincial Health Services Authority	Vancouver	BC	Medical	Nuclear medicine
2022-03-30	Centre hospitalier de l'Université de Montréal	Montréal	QC	Medical	Nuclear medicine
2022-03-30	Centre hospitalier de l'Université de Montréal	Montréal	QC	Medical	Nuclear medicine
2022-03-30	Alberta Health Services	Edmonton	AB	Medical	Nuclear medicine
2022-04-01	Best Theratronics Ltd.	Ottawa	ON	Commercial	Servicing
2022-04-05	Provincial Health Services Authority	Vancouver	BC	Medical	Radiation therapy
2022-04-07	MSALABS Inc.	Val d'Or	QC	Industrial	Other
2022-04-08	AVC Clinics (British Columbia) Ltd.	Victoria	BC	Medical	Veterinary nuclear medicine
2022-04-08	WSP Canada Inc.	Toronto	ON	Industrial	Portable gauge
2022-04-12	Almadon Holdings Ltd.	Calgary	AB	Medical	Nuclear medicine
2022-04-20	Slick Inspection Limited	Kindersley	SK	Industrial	Industrial radiography
2022-04-21	ABB Inc.	Saint-Laurent	QC	Commercial	Servicing
2022-04-21	ABB Inc.	Saint-Laurent	QC	Commercial	Distribution
2022-04-22	University Health Network	Toronto	ON	Commercial	Isotope production
2022-04-25	University Health Network	Toronto	ON	Medical	Radiation therapy
2022-04-25	Nova Scotia Power Incorporated	Point Aconi	NS	Industrial	Portable gauge
2022-04-25	SM Walker Consulting Ltd.	Reserve Mines	NS	Industrial	Portable gauge
2022-04-25	Atlantic Plant Installation Canada Inc.	Lingan	NS	Industrial	Industrial radiography
2022-04-26	Alberta Health Services	Calgary	AB	Medical	Radiation therapy
2022-04-26	Nova Scotia Power Incorporated	Point Tupper	NS	Industrial	Portable gauge
2022-04-26	Laboratoire X inc.	Terrebonne	QC	Industrial	Portable gauge
2022-04-26	Nova Scotia Health Authority	New Glasgow	NS	Medical	Nuclear medicine
2022-04-26	Radioprotection Inc.	Boisbriand	QC	Commercial	Calibration
2022-04-27	Alberta Health Services	Calgary	AB	Medical	Radiation therapy
2022-04-27	Nova Scotia Power Incorporated	Trenton	NS	Industrial	Portable gauge
2022-04-27	Tuboscope Vetco Canada ULC	Red Deer	AB	Industrial	Portable gauge
2022-04-27	Centre intégré universitaire de santé et de services sociaux du Centre-Ouest-de-l'Île-de-Montréal	Montréal	QC	Academic and research	Laboratory studies and consolidated use
2022-04-27	Michelin North America (Canada) Inc.	New Glasgow	NS	Industrial	Fixed gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-04-27	Imperial Oil Limited / Compagnie Pétrolière Impériale Ltée	Nanticoke	ON	Industrial	Fixed gauge
2022-04-27	Nova Scotia Power Incorporated	Trenton	NS	Industrial	Fixed gauge
2022-04-27	Element Technical Services Inc.	Red Deer	AB	Industrial	Fixed gauge
2022-04-27	Alberta Health Services	Calgary	AB	Commercial	Processing of nuclear substances
2022-04-27	Imperial Oil	Nanticoke	ON	Industrial	Calibration
2022-04-28	DesignPoint Engineering & Surveying Ltd.	Bedford	NS	Industrial	Portable gauge
2022-04-28	Atlas Testing Labs & Services (Nova Scotia) Ltd.	Salt Springs	NS	Industrial	Industrial radiography
2022-04-28	Atlas Testing Labs & Services (Nova Scotia) Ltd.	Thorburn	NS	Industrial	Industrial radiography
2022-04-28	INEOS Canada Company	Joffre	AB	Industrial	Fixed gauge
2022-04-28	STEP Energy Services Ltd.	Lacombe	AB	Industrial	Fixed gauge
2022-04-28	Centre intégré universitaire de santé et de services sociaux de l'Est-de-l'Île-de-Montréal	Montréal	QC	Academic and research	Laboratory studies and consolidated use
2022-04-28	8693030 Canada Inc.	Pointe-Claire	QC	Medical	Veterinary nuclear medicine
2022-04-29	G&S Consultants	Chateauguay	QC	Industrial	Portable gauge
2022-04-29	9395-8049 QC inc.	Repentigny	QC	Industrial	Portable gauge
2022-04-29	9395-8049 QC inc.	Repentigny	QC	Industrial	Portable gauge
2022-04-29	9395-8049 QC inc.	Repentigny	QC	Industrial	Portable gauge
2022-04-29	9395-8049 QC inc.	Saint-Laurent	QC	Industrial	Portable gauge
2022-04-29	E2K Engineering Ltd.	Calgary	AB	Industrial	Portable gauge
2022-04-29	SNC-Lavalin GEM Québec Inc.	Laval	QC	Industrial	Portable gauge
2022-04-29	SNC-Lavalin GEM Québec Inc.	Laval	QC	Industrial	Portable gauge
2022-04-29	Custom Fabricators & Machinists Limited	Dartmouth	NS	Industrial	Industrial radiography
2022-04-29	Sanjel Energy Services Inc.	Red Deer	AB	Industrial	Fixed gauge
2022-05-02	Mill-Am Corporation	Windsor	ON	Industrial	Portable gauge
2022-05-02	Capital Power Corporation (Genesee Station)	Leduc County	AB	Industrial	Fixed gauge
2022-05-02	Schlumberger Canada Limited	Nisku	AB	Industrial	Fixed gauge
2022-05-03	C.T. Soil & Materials Testing Inc.	Windsor	ON	Industrial	Portable gauge
2022-05-03	City of Windsor	Windsor	ON	Industrial	Portable gauge
2022-05-03	Echo NDE Inc.	Red Deer	AB	Industrial	Industrial radiography
2022-05-03	Imperial Oil Limited / Compagnie Pétrolière Impériale Ltée	Edmonton	AB	Industrial	Fixed gauge

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2022-05-03	Inter Pipeline Propylene Ltd.	Fort Saskatchewan	AB	Industrial	Fixed gauge
2022-05-03	Healthy Heart Institute Inc.	Red Deer	AB	Medical	Nuclear medicine
2022-05-04	Northern Alberta Institute of Technology	Edmonton	AB	Industrial	Portable gauge
2022-05-04	Windsor Regional Hospital	Windsor	ON	Medical	Nuclear medicine
2022-05-04	Alberta Health Services	Calgary	AB	Medical	Nuclear medicine
2022-05-04	Alberta Health Services	Calgary	AB	Medical	Nuclear medicine
2022-05-04	Windsor Regional Hospital	Windsor	ON	Medical	Nuclear medicine
2022-05-04	Alberta Health Services	Calgary	AB	Medical	Nuclear medicine
2022-05-04	Alberta Health Services	Calgary	AB	Medical	Nuclear medicine
2022-05-04	ALARA Consultants Inc.	Edmonton	AB	Commercial	Calibration
2022-05-05	ENC Testing Inc.	St. Albert	AB	Industrial	Portable gauge
2022-05-05	Coco Paving Inc.	Windsor	ON	Industrial	Portable gauge
2022-05-05	Tetra Tech Canada Inc.	Edmonton	AB	Industrial	Portable gauge
2022-05-05	Tetra Tech Canada Inc.	Edmonton	AB	Industrial	Portable gauge
2022-05-05	ODF Nutra Inc.	St-Hyacinthe	QC	Industrial	Fixed gauge
2022-05-05	Windsor Regional Hospital	Windsor	ON	Medical	Nuclear medicine
2022-05-05	Windsor Regional Hospital	Windsor	ON	Medical	Nuclear medicine
2022-05-06	2851409 Ontario Inc.	Belle River	ON	Medical	Nuclear medicine
2022-05-09	Centre intégré universitaire de santé et de services sociaux du Saguenay–Lac-Saint-Jean	Chicoutimi	QC	Medical	Radiation therapy
2022-05-09	Fidelity Engineering & Construction Inc.	Colborne	ON	Industrial	Portable gauge
2022-05-09	Weatherford Canada Ltd.	Dresden	ON	Industrial	Oil-well logging
2022-05-09	Quinte Healthcare Corporation	Belleville	ON	Medical	Nuclear medicine
2022-05-09	Quinte Healthcare Corporation	Belleville	ON	Medical	Nuclear medicine
2022-05-10	Tomlinson Enterprises Ltd.	Sarnia	ON	Industrial	Industrial radiography
2022-05-10	Bureau of Customs and Border Protection	Sarnia	ON	Industrial	Fixed gauge
2022-05-10	Kingston General Hospital	Kingston	ON	Medical	Nuclear medicine
2022-05-10	Kingston General Hospital	Kingston	ON	Medical	Nuclear medicine
2022-05-10	Groupe Vétéri Médic Inc.	Brossard	QC	Medical	Veterinary nuclear medicine
2022-05-11	SNC-Lavalin GEM Ontario Inc.	Kingston	ON	Industrial	Portable gauge
2022-05-11	Cambium Inc.	Kingston	ON	Industrial	Portable gauge
2022-05-11	Interface Testing Services Inc.	Sarnia	ON	Industrial	Industrial radiography
2022-05-11	Baker Hughes Canada Company	Sarnia	ON	Industrial	Oil-well logging
2022-05-12	Groupe ABS Inc.	St-Rémi	QC	Industrial	Portable gauge
2022-05-12	Malroz Engineering Inc.	Kingston	ON	Industrial	Portable gauge

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2022-05-12	Canadian Tower Scanning Inc.	Sarnia	ON	Industrial	Oil-well logging
2022-05-12	Kingston Heart Clinic Nuclear and Vascular Laboratory Inc.	Kingston	ON	Medical	Nuclear medicine
2022-05-13	Loyalist College of Applied Arts and Technology	Belleville	ON	Industrial	Portable gauge
2022-05-13	EXP Services Inc. / Les Services EXP Inc.	Kingston	ON	Industrial	Portable gauge
2022-05-16	Nova Scotia Health Authority	Sydney	NS	Commercial	Isotope production
2022-05-16	Vale Newfoundland & Labrador Limited	Long Harbour	NL	Industrial	Fixed gauge
2022-05-17	Nova Scotia Health Authority	Halifax	NS	Medical	Radiation therapy
2022-05-17	Meridian Engineering Inc.	Clarenville	NL	Industrial	Portable gauge
2022-05-17	DGI Geoscience Inc.	Gander	NL	Industrial	Oil-well logging
2022-05-17	Grumble Hill Limited	Port Perry	ON	Medical	Nuclear medicine
2022-05-18	DMG Consulting Limited	Gander	NL	Industrial	Portable gauge
2022-05-18	Central Regional Integrated Health Authority	Gander	NL	Medical	Nuclear medicine
2022-05-19	Nova Scotia Health Authority	Sydney	NS	Medical	Other
2022-05-19	Braya Renewable Fuels (Newfoundland) GP Inc.	Come by Chance	NL	Industrial	Industrial radiography
2022-05-19	Collingwood General & Marine Hospital	Collingwood	ON	Medical	Nuclear medicine
2022-05-20	Wood Canada Limited / Wood Canada Limitée	St. John's	NL	Industrial	Portable gauge
2022-05-26	Shawcor Ltd./Shawcor Ltée	Toronto	ON	Industrial	Other
2022-05-30	WAV Inspection Ltd.	Brooks	AB	Industrial	Industrial radiography
2022-05-30	1788966 Alberta Ltd.	Redcliff	AB	Industrial	Oil-well logging
2022-05-31	Slick Inspection Limited	Medicine Hat	AB	Industrial	Industrial radiography
2022-05-31	Federal White Cement Ltd.	Zorra Township	ON	Industrial	Fixed gauge
2022-05-31	STC Steel Technologies Canada Ltd.	Woodstock	ON	Industrial	Fixed gauge
2022-05-31	Advanced Cardiology Consultants and Diagnostics Inc.	Medicine Hat	AB	Medical	Nuclear medicine
2022-06-01	NWP Industries General Partner Ltd.	Medicine Hat	AB	Industrial	Industrial radiography
2022-06-01	Medicine Hat Regional Hospital	Medicine Hat	AB	Medical	Nuclear medicine
2022-06-01	Medicine Hat Regional Hospital	Medicine Hat	AB	Medical	Nuclear medicine
2022-06-02	Vision Integrity Engineering Ltd.	Medicine Hat	AB	Industrial	Industrial radiography
2022-06-02	ROFS Canada Ltd.	Redcliff	AB	Industrial	Oil-well logging
2022-06-03	Slick Inspection Limited	Medicine Hat	AB	Industrial	Industrial radiography

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2022-06-03	Isologic Innovative Radiopharmaceuticals Ltd.	Burlington	ON	Commercial	Processing of nuclear substances
2022-06-06	Institut national de la recherche scientifique	Québec	QC	Industrial	Fixed gauge
2022-06-07	Groupe ABS Inc.	Lévis	QC	Industrial	Portable gauge
2022-06-07	Mistras Services Inc.	Lévis	QC	Industrial	Industrial radiography
2022-06-08	Nucléom Inc.	Québec	QC	Industrial	Industrial radiography
2022-06-08	Groupe vétérinaire Daubigny Inc.	Québec	QC	Medical	Veterinary nuclear medicine
2022-06-09	Laboratoires d'Expertises de Québec Ltée	Québec	QC	Industrial	Portable gauge
2022-06-09	Héma-Québec	Sainte-Foy	QC	Medical	Other
2022-06-13	TISI Canada Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-06-13	Siemens Healthcare Limited / Siemens Santé limitée	Oakville	ON	Commercial	Servicing
2022-06-13	Grey Nuns Community Health Centre	Edmonton	AB	Medical	Nuclear medicine
2022-06-13	Covenant Health	Edmonton	AB	Medical	Nuclear medicine
2022-06-14	SolidEarth Geotechnical Inc.	Edmonton	AB	Industrial	Portable gauge
2022-06-14	Acuren Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-06-15	Buffalo Inspection Services (2005) Inc.	Camrose	AB	Industrial	Industrial radiography
2022-06-15	Buffalo Inspection Services (2005) Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-06-15	Buffalo Inspection Services (2005) Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-06-15	Buffalo Inspection Services (2005) Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-06-15	Buffalo Inspection Services (2005) Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-06-20	University Health Network	Toronto	ON	Medical	Radiation therapy
2022-06-21	Acuren Inc.	Oakville	ON	Industrial	Industrial radiography
2022-06-21	Alliston Diagnostic Centre Inc.	Alliston	ON	Medical	Nuclear medicine
2022-06-21	Moore Equine Veterinary Centre Ltd.	Rocky View	AB	Medical	Veterinary nuclear medicine
2022-06-22	Canadian Institute for Non-destructive Evaluation	Hamilton	ON	Industrial	Industrial radiography
2022-06-22	TISI Canada Inc.	Oakville	ON	Industrial	Industrial radiography

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-06-23	TISI Canada Inc.	Kitchener	ON	Industrial	Industrial radiography
2022-06-27	Université Concordia/ Concordia University	Montréal	QC	Medical	Nuclear medicine
2022-06-28	Lakeridge Health	Oshawa	ON	Medical	Radiation therapy
2022-06-30	Watt Consulting Group Ltd.	Calgary	AB	Industrial	Portable gauge
2022-06-30	Watt Consulting Group Ltd.	Calgary	AB	Industrial	Portable gauge
2022-06-30	Centre intégré universitaire de santé et de services sociaux du Nord-de-l'Île-de-Montréal	Montréal	QC	Medical	Nuclear medicine
2022-06-30	Centre intégré universitaire de santé et de services sociaux du Nord-de-l'Île-de-Montréal	Montréal	QC	Medical	Nuclear medicine
2022-07-04	Manitoba Hydro	Navin	MB	Industrial	Portable gauge
2022-07-04	EXL Engineering Inc.	Kelowna	BC	Industrial	Portable gauge
2022-07-04	Acuren Inc.	Castlegar	BC	Industrial	Industrial radiography
2022-07-04	Kelowna General Hospital	Kelowna	BC	Medical	Nuclear medicine
2022-07-04	Kelowna General Hospital	Kelowna	BC	Medical	Nuclear medicine
2022-07-05	City of Brandon	Brandon	MB	Industrial	Portable gauge
2022-07-05	Glade Materials Testing Ltd.	Castlegar	BC	Industrial	Portable gauge
2022-07-05	Walgren Soils Testing Ltd.	Nelson	BC	Industrial	Portable gauge
2022-07-05	Alpha Adroit Engineering Ltd.	Edmonton	AB	Industrial	Portable gauge
2022-07-05	Sandhill Materials Inc.	Kelowna	BC	Industrial	Portable gauge
2022-07-05	Burns Maendel Consulting Engineers Ltd.	Brandon	MB	Industrial	Portable gauge
2022-07-05	West-Can Inspection Ltd.	Sunnyside	MB	Industrial	Industrial radiography
2022-07-05	Pro-Test Professional Testing & Inspection Co. Ltd.	Winnipeg	MB	Industrial	Industrial radiography
2022-07-05	KPGP Inc.	Crabtree	QC	Industrial	Fixed gauge
2022-07-05	Inteplast Bags and Films Corporation	Lanoraie-d'Autray	QC	Industrial	Fixed gauge
2022-07-05	University of British Columbia	Kelowna	BC	Academic and research	Laboratory studies and consolidated use
2022-07-05	University of British Columbia	Balfour	BC	Academic and research	Laboratory studies and consolidated use
2022-07-05	University of British Columbia	Kelowna	BC	Academic and research	Laboratory studies and consolidated use
2022-07-05	University of British Columbia	Kelowna	BC	Academic and research	Laboratory studies and consolidated use
2022-07-06	M. Block & Associates Limited	Winnipeg	MB	Industrial	Portable gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-07-06	Manitoba Infrastructure	Winnipeg	MB	Industrial	Portable gauge
2022-07-06	Manitoba Infrastructure	Portage la Prairie	MB	Industrial	Portable gauge
2022-07-06	Frank Cunsolo Consulting Inc.	Penticton	BC	Industrial	Portable gauge
2022-07-06	TTES Consulting Inc.	MacGregor	MB	Industrial	Portable gauge
2022-07-06	TTES Consulting Inc.	Brandon	MB	Industrial	Portable gauge
2022-07-06	Acuren Inc.	Castlegar	BC	Industrial	Industrial radiography
2022-07-06	Labatt Brewing Company Ltd. / La Brasserie Labatt limitée	Creston	BC	Industrial	Fixed gauge
2022-07-06	Agriculture and Agri-Food Canada	Summerland	BC	Academic and research	Laboratory studies and consolidated use
2022-07-06	Health Canada / Santé Canada	Winnipeg	MB	Academic and research	Laboratory studies and consolidated use
2022-07-06	Prairie Mountain Health	Brandon	MB	Medical	Nuclear medicine
2022-07-06	Prairie Mountain Health	Brandon	MB	Medical	Nuclear medicine
2022-07-06	Le Groupe Dimension Multi Vétérinaire Inc.	Montréal	QC	Medical	Veterinary nuclear medicine
2022-07-07	Montreal Neurological Institute-Hospital / Institut-Hôpital neurologique de Montréal	Montreal	QC	Commercial	Isotope production
2022-07-07	Trek Geotechnical Inc.	Winnipeg	MB	Industrial	Portable gauge
2022-07-07	Ecora Engineering & Resource Group Ltd.	Penticton	BC	Industrial	Portable gauge
2022-07-07	Ecora Engineering & Resource Group Ltd.	Penticton	BC	Industrial	Portable gauge
2022-07-07	Winpak Ltd.	Winnipeg	MB	Industrial	Fixed gauge
2022-07-07	Kootenay Boundary Regional Hospital	Trail	BC	Medical	Nuclear medicine
2022-07-07	Kootenay Boundary Regional Hospital	Trail	BC	Medical	Nuclear medicine
2022-07-07	Canadian Blood Services / Société canadienne du sang	Winnipeg	MB	Medical	Other
2022-07-08	Glade Materials Testing Ltd.	Castlegar	BC	Industrial	Portable gauge
2022-07-08	Glade Materials Testing Ltd.	Castlegar	BC	Industrial	Portable gauge
2022-07-08	H. Manalo Consulting	Winnipeg	MB	Industrial	Portable gauge
2022-07-11	UT Quality Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-07-11	Thermo Design Engineering Ltd.	Edmonton	AB	Industrial	Industrial radiography
2022-07-12	City of Edmonton	Edmonton	AB	Industrial	Portable gauge
2022-07-12	Metalcare Group Inc.	Edmonton	AB	Industrial	Industrial radiography

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-07-12	Mistras Services Inc.	Saint-Lambert	QC	Industrial	Industrial radiography
2022-07-12	Tracerco Radioactive Diagnostic Services Canada, Inc.	Edmonton	AB	Industrial	Oil-well logging
2022-07-13	Laboratoire d'essai Mequaltech Inc.	Montréal	QC	Industrial	Industrial radiography
2022-07-13	Les Inspections Thermetco Inc.	Montréal	QC	Industrial	Industrial radiography
2022-07-13	ALCO Gas & Oil Production Equipment Ltd.	Edmonton	AB	Industrial	Industrial radiography
2022-07-13	Streamline Inspection Limited	Fort Saskatchewan	AB	Industrial	Industrial radiography
2022-07-13	React Radiography Ltd.	Edmonton	AB	Industrial	Industrial radiography
2022-07-14	Englobe Corp.	Edmonton	AB	Industrial	Portable gauge
2022-07-14	Englobe Corp.	Edmonton	AB	Industrial	Portable gauge
2022-07-14	Metalogic Inspection Services Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-07-18	Centre intégré universitaire de santé et de services sociaux du Centre-Ouest-de-l'Île-de-Montréal	Montréal	QC	Medical	Radiation therapy
2022-07-19	Iron Ore Company of Canada	Labrador City	NL	Industrial	Fixed gauge
2022-07-19	Halton HealthCare Services Corporation	Oakville	ON	Medical	Nuclear medicine
2022-07-19	Halton Healthcare Services Corporation	Oakville	ON	Medical	Nuclear medicine
2022-07-20	Tacora Resources	Wabush	NL	Industrial	Fixed gauge
2022-07-20	Northwest Nuclear Imaging Limited	Scarborough	ON	Medical	Nuclear medicine
2022-07-20	Scarborough and Rouge Hospital	Scarborough	ON	Medical	Nuclear medicine
2022-07-20	Scarborough Health Network	Scarborough	ON	Medical	Nuclear medicine
2022-07-21	Southlake Regional Health Centre	Newmarket	ON	Medical	Nuclear medicine
2022-07-21	MyHealth Partners Inc.	Milton	ON	Medical	Nuclear medicine
2022-07-21	Southlake Regional Health Centre	Newmarket	ON	Medical	Nuclear medicine
2022-07-26	KMH Cardiology Centres Incorporated	Mississauga	ON	Commercial	Processing of nuclear substances
2022-07-26	KMH Cardiology Centres Incorporated	Burlington	ON	Medical	Nuclear medicine
2022-07-26	KMH Cardiology Centres Incorporated	Mississauga	ON	Medical	Nuclear medicine
2022-07-27	Watt Consulting Group Ltd.	Calgary	AB	Industrial	Portable gauge
2022-08-02	Alberta Health Services	Edmonton	AB	Academic and research	Laboratory studies and consolidated use
2022-08-02	Westrock Company of Canada Corp. / Compagnie Westrock du Can	Pointe-aux-Trembles	QC	Industrial	Fixed gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-08-03	Aecom Canada Ltd.	Edmonton	AB	Industrial	Portable gauge
2022-08-03	Advanced Cardiology Consultants and Diagnostics Inc.	Edmonton	AB	Medical	Nuclear medicine
2022-08-04	PCL Construction Management Inc.	Edmonton	AB	Industrial	Portable gauge
2022-08-04	Pine Environmental Canada Inc.	Edmonton	AB	Commercial	Distribution
2022-08-05	Provincial Health Services Authority	Abbotsford	BC	Medical	Radiation therapy
2022-08-08	Englobe Corp.	North Bay	ON	Industrial	Portable gauge
2022-08-08	1650939 Ontario Ltd.	Capreol	ON	Industrial	Portable gauge
2022-08-08	Tracerco Radioactive Diagnostic Services Canada, Inc.	Edmonton	AB	Industrial	Oil-well logging
2022-08-09	Terraprobe Testing Ltd.	Sudbury	ON	Industrial	Portable gauge
2022-08-09	Interpaving Asphalt and Aggregate Supply Ltd.	Sudbury	ON	Industrial	Portable gauge
2022-08-09	Stasuk Testing & Inspection Ltd.	Burnaby	BC	Industrial	Industrial radiography
2022-08-09	Rayonier A.M. Canada Enterprises Inc. / Entreprises Rayonier A.M. Canada Inc.	Témiscaming	QC	Industrial	Fixed gauge
2022-08-09	Lafarge Canada Inc.	Richmond	BC	Industrial	Fixed gauge
2022-08-10	Garson Pipe Contractors Limited	Garson	ON	Industrial	Portable gauge
2022-08-10	Acuren Inc.	Richmond	BC	Industrial	Industrial radiography
2022-08-10	Acuren Inc.	Burnaby	BC	Industrial	Industrial radiography
2022-08-10	Glencore Canada Corporation	Falconbridge	ON	Industrial	Fixed gauge
2022-08-10	North Bay General Hospital	North Bay	ON	Medical	Nuclear medicine
2022-08-10	North Bay General Hospital	North Bay	ON	Medical	Nuclear medicine
2022-08-11	City of Vancouver	Vancouver	BC	Industrial	Portable gauge
2022-08-11	R.M. Bélanger Limited	Chelmsford	ON	Industrial	Portable gauge
2022-08-11	R.M. Bélanger Limited	Chelmsford	ON	Industrial	Portable gauge
2022-08-11	R.M. Bélanger Limited	Chelmsford	ON	Industrial	Portable gauge
2022-08-11	KDT Consulting Services	St. Charles	ON	Industrial	Portable gauge
2022-08-11	EXP Services Inc. / Les Services EXP Inc.	New Liskeard	ON	Industrial	Portable gauge
2022-08-11	Miller Paving Limited	New Liskeard	ON	Industrial	Portable gauge
2022-08-11	All Road Construction Inc.	Coquitlam	BC	Industrial	Portable gauge
2022-08-12	Shaba Testing Services Ltd.	Kirkland Lake	ON	Industrial	Portable gauge
2022-08-15	Groupe Conseil SCT inc.	St-Jean-sur-Richelieu	QC	Industrial	Portable gauge
2022-08-15	Whitecap Resources Inc.	Calgary	AB	Industrial	Fixed gauge
2022-08-16	Pavages Maska Inc.	St-Hyacinthe	QC	Industrial	Portable gauge
2022-08-16	Stantec Consulting Ltd.	Mooseland	NS	Industrial	Portable gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-08-16	Chinook Mine Construction Company Ltd.	Hinton	AB	Industrial	Portable gauge
2022-08-16	ArcelorMittal Long Products Canada Real Estate Inc.	Contrecoeur	QC	Industrial	Fixed gauge
2022-08-16	Maibec Inc.	East River	NS	Industrial	Fixed gauge
2022-08-16	Alberta Health Services	Hinton	AB	Medical	Nuclear medicine
2022-08-17	Baillargeon Matériaux Inc.	St-Jean-sur-Richelieu	QC	Industrial	Portable gauge
2022-08-17	Carrière Bernier Ltée	St-Jean-sur-Richelieu	QC	Industrial	Portable gauge
2022-08-17	Alexman Contracting Inc.	Thornton	ON	Industrial	Portable gauge
2022-08-17	WSP Canada Inc.	Edson	AB	Industrial	Portable gauge
2022-08-17	WSP Canada Inc.	Edson	AB	Industrial	Portable gauge
2022-08-17	Dalhousie University	Halifax	NS	Academic and research	Laboratory studies and consolidated use
2022-08-17	Dalhousie University	Halifax	NS	Academic and research	Laboratory studies and consolidated use
2022-08-18	Windsor Regional Hospital	Windsor	ON	Medical	Radiation therapy
2022-08-18	Les Laboratoires de la Montérégie Inc.	St-Hyacinthe	QC	Industrial	Portable gauge
2022-08-18	Groupe ABS Inc.	St-Rémi	QC	Industrial	Portable gauge
2022-08-18	Wood Canada Limited / Wood Canada Limitée	Dartmouth	NS	Industrial	Portable gauge
2022-08-18	E.F. Monk Holdings Limited	Dartmouth	NS	Industrial	Industrial radiography
2022-08-18	Ezeflow Inc.	Granby	QC	Industrial	Industrial radiography
2022-08-18	Ezeflow Inc.	Granby	QC	Industrial	Industrial radiography
2022-08-18	Foothills Radiography & Inspection Services Ltd.	Edson	AB	Industrial	Industrial radiography
2022-08-18	Prairie Mines & Royalty ULC	Edson	AB	Industrial	Oil-well logging
2022-08-19	Régie régionale de la santé A / Regional Health Authority A	Bathurst	NB	Medical	Radiation therapy
2022-08-19	Englobe Corp.	Dartmouth	NS	Industrial	Portable gauge
2022-08-19	Nelson's Welding Inspection Limited	Drayton Valley	AB	Industrial	Industrial radiography
2022-08-19	Nelson's Welding Inspection Limited	Drayton Valley	AB	Industrial	Industrial radiography
2022-08-19	Cascades Canada ULC	Candiac	QC	Industrial	Fixed gauge
2022-08-22	Metalogic Inspection Services Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-08-22	Metalogic Inspection Services Inc.	Edmonton	AB	Industrial	Industrial radiography

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-08-23	Thurber Engineering Ltd.	Kitimat	BC	Industrial	Portable gauge
2022-08-23	Inline Group Inc.	Kitimat	BC	Industrial	Portable gauge
2022-08-24	Allnorth Consultants Limited	Kitimat	BC	Industrial	Portable gauge
2022-08-24	Metro Testing & Engineering Ltd.	Terrace	BC	Industrial	Portable gauge
2022-08-25	Allnorth Consultants Limited	Terrace	BC	Industrial	Portable gauge
2022-08-25	Nighat Geo Services Inc.	Terrace	BC	Industrial	Portable gauge
2022-08-25	McElhanney Ltd.	Terrace	BC	Industrial	Portable gauge
2022-08-25	Kamit Group Ltd.	Kitimat	BC	Industrial	Industrial radiography
2022-08-25	Probe Technologies Canada Ltd.	Calgary	AB	Academic and research	Other
2022-08-26	GeoNorth Engineering Ltd.	Kitimat	BC	Industrial	Portable gauge
2022-08-26	PHA Engineering Ltd.	Thunder Bay	ON	Industrial	Portable gauge
2022-08-29	Confederation College of Applied Arts and Technology	Thunder Bay	ON	Industrial	Portable gauge
2022-08-29	Taranis Contracting Group Ltd.	Thunder Bay	ON	Industrial	Portable gauge
2022-08-29	Frontera Geotechnical Inc.	Squamish	BC	Industrial	Portable gauge
2022-08-30	Keewatin-Aski Ltd.	Sioux Lookout	ON	Industrial	Portable gauge
2022-08-30	Hatch Ltd.	Thunder Bay	ON	Industrial	Portable gauge
2022-08-30	Horizon Engineering Inc.	North Vancouver	BC	Industrial	Portable gauge
2022-08-30	KCS Plastics Ltd.	Langley	BC	Industrial	Fixed gauge
2022-08-30	Resolute FP Canada Inc. / PF Résolu Canada Inc.	Thunder Bay	ON	Industrial	Fixed gauge
2022-08-31	TBT Engineering Limited	Thunder Bay	ON	Industrial	Portable gauge
2022-08-31	TBT Engineering Limited	Thunder Bay	ON	Industrial	Portable gauge
2022-08-31	Bruno's Contracting (Thunder Bay) Ltd.	Thunder Bay	ON	Industrial	Portable gauge
2022-08-31	Advance Testing Ltd.	Surrey	BC	Industrial	Portable gauge
2022-08-31	Celator Pharmaceuticals Corp.	Vancouver	BC	Academic and research	Laboratory studies and consolidated use
2022-08-31	Cooley, Inc.	Mount Forest	ON	Industrial	Fixed gauge
2022-09-01	BRI Biopharmaceutical Research Inc.	Vancouver	BC	Academic and research	Laboratory studies and consolidated use
2022-09-01	BC Neuroimmunology Lab Inc.	Vancouver	BC	Academic and research	Laboratory studies and consolidated use
2022-09-01	Centre hospitalier de l'Université de Montréal	Montréal	QC	Academic and research	Laboratory studies and consolidated use
2022-09-02	Stantec Consulting Ltd.	Thunder Bay	ON	Industrial	Portable gauge
2022-09-06	Taylor Geotechnical Ltd.	Canmore	AB	Industrial	Portable gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-09-09	Thunder Bay Regional Health Sciences Centre	Thunder Bay	ON	Medical	Radiation therapy
2022-09-16	EXP Services Inc. / Les Services EXP Inc.	Laval	QC	Industrial	Portable gauge
2022-09-19	SRK Consulting (Canada) Inc.	Saskatoon	SK	Industrial	Portable gauge
2022-09-20	Saskatchewan Research Council	Saskatoon	SK	Academic and research	Laboratory studies and consolidated use
2022-09-22	Potash Corporation of Saskatchewan Inc.	Vanscoy	SK	Industrial	Fixed gauge
2022-09-23	Prairie Road Solutions Inc.	Saskatoon	SK	Industrial	Portable gauge
2022-09-23	Radiation Safety Institute of Canada	Saskatoon	SK	Commercial	Calibration
2022-09-23	Radiation Safety Institute of Canada	Saskatoon	SK	Industrial	Calibration
2022-09-23	Radiation Safety Institute of Canada	Saskatoon	SK	Academic and research	Calibration
2022-09-26	SNC-Lavalin Industrial Atlantic Inc.	St. John's	NL	Industrial	Industrial radiography
2022-09-26	SNC-Lavalin Industrial Atlantic Inc.	Mount Pearl	NL	Industrial	Industrial radiography
2022-09-26	SNC -Lavalin Industrial Atlantic Inc.	St. John's	NL	Industrial	Industrial radiography
2022-09-27	MPE Engineering Ltd.	Red Deer	AB	Industrial	Portable gauge
2022-09-27	MPE Engineering Ltd.	Red Deer	AB	Industrial	Portable gauge
2022-09-27	Acuren Inc.	St. John's	NL	Industrial	Industrial radiography
2022-09-27	Cenovus Energy Inc.	St. John's	NL	Industrial	Fixed gauge
2022-09-27	Cenovus Energy Inc.	Bay Bulls	NL	Industrial	Fixed gauge
2022-09-27	Cenovus Energy Inc.	St. John's	NL	Industrial	Fixed gauge
2022-09-27	Cenovus Energy Inc.	Bay Bulls	NL	Industrial	Fixed gauge
2022-09-28	Government of Newfoundland and Labrador Department of Transport and Infrastructure	St. John's	NL	Industrial	Portable gauge
2022-09-28	Aker Solutions Asset Integrity and Management Canada Inc.	St. John's	NL	Industrial	Industrial radiography
2022-09-28	Edge Wireline Inc.	Red Deer	AB	Industrial	Oil-well logging
2022-09-28	Geolog Solutions Inc.	Red Deer County	AB	Industrial	Oil-well logging
2022-09-29	CHU de Québec – Université Laval	Quebec	QC	Medical	Other
2022-09-29	CHU de Québec – Université Laval	Quebec	QC	Medical	Radiation therapy
2022-09-29	City of St. John's	St. John's	NL	Industrial	Portable gauge
2022-09-29	ASF Associates Inc.	Cambridge	ON	Industrial	Portable gauge
2022-09-29	Browning Harvey Limited	St. John's	NL	Industrial	Fixed gauge
2022-09-30	Centre intégré de santé et de services sociaux de Chaudière-Appalaches	Lévis	QC	Medical	Radiation therapy

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-10-03	Groupe Conseil SCT inc.	Brossard	QC	Industrial	Portable gauge
2022-10-03	Beairsto & Associates Engineering Ltd.	Grande Prairie	AB	Industrial	Portable gauge
2022-10-03	Aurora Inspections Limited	Sexsmith	AB	Industrial	Industrial radiography
2022-10-03	Gamma Spec NDT Ltd.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-03	LOS Canada Operations ULC	Clairmont	AB	Industrial	Fixed gauge
2022-10-03	Tara Energy Services Inc.	Clairmont	AB	Industrial	Fixed gauge
2022-10-03	LOS Canada Operations ULC	Clairmont	AB	Commercial	Servicing
2022-10-04	Inspectrum Testing Inc.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-04	20/20 ND Technology Inc.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-04	Nortech Advanced NDT Ltd.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-04	S.G.H. Inspection Ltd.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-04	Anode NDT Ltd.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-04	Buffalo Inspection Services (2005) Inc.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-05	J.R. Paine & Associates Ltd.	Grande Prairie	AB	Industrial	Portable gauge
2022-10-05	McIntosh Perry Limited	Grande Prairie	AB	Industrial	Portable gauge
2022-10-05	Inspectrum Testing Inc.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-05	20/20 ND Technology Inc.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-05	Gunron Inspections Ltd.	Yellowhead County	AB	Industrial	Industrial radiography
2022-10-06	Aurora Inspections Limited	Sexsmith	AB	Industrial	Industrial radiography
2022-10-06	Anode NDT Ltd.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-06	Acuren Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-10-06	Omnifission Inc.	Brampton	ON	Commercial	Servicing
2022-10-06	Core Laboratories Canada Ltd.	Grande Prairie	AB	Industrial	Other
2022-10-06	1908273 Ontario Ltd.	Vaughan	ON	Medical	Nuclear medicine
2022-10-11	Building Bay Inc.	Calgary	AB	Industrial	Portable gauge
2022-10-11	9263-7974 Québec Inc.	Laval	QC	Industrial	Portable gauge
2022-10-12	Nighat Geo Services Inc.	Edmonton	AB	Industrial	Portable gauge
2022-10-12	Saputo Produits Laitiers Canada S.E.N.C.	St-Hyacinthe	QC	Industrial	Fixed gauge
2022-10-13	B.I.G. Consulting Inc.	Mississauga	ON	Industrial	Portable gauge
2022-10-13	Lou Champagne Systems Inc.	Oakville	ON	Commercial	Calibration
2022-10-17	Englobe Corp.	Ottawa	ON	Industrial	Portable gauge
2022-10-17	Michel Lacroix Construction Inc.	Maniwaki	QC	Industrial	Portable gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-10-17	Acciona Infrastructure Canada Inc.	Surrey	BC	Industrial	Portable gauge
2022-10-17	A-Class Testing Ltd.	Surrey	BC	Industrial	Portable gauge
2022-10-17	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Academic and research	Laboratory studies and consolidated use
2022-10-17	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Medical	Nuclear medicine
2022-10-17	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Medical	Nuclear medicine
2022-10-17	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Medical	Nuclear medicine
2022-10-18	Valley Geotechnical Engineering Services Ltd.	Langley	BC	Industrial	Portable gauge
2022-10-18	Acuren Inc.	Langley	BC	Industrial	Industrial radiography
2022-10-18	Isologic Innovative Radiopharmaceuticals Ltd.	Ottawa	ON	Commercial	Processing of nuclear substances
2022-10-19	Englobe Corp.	Laval	QC	Industrial	Portable gauge
2022-10-19	Fraser Valley Engineering Ltd.	Abbotsford	BC	Industrial	Portable gauge
2022-10-19	GeoWest Engineering Ltd.	Abbotsford	BC	Industrial	Portable gauge
2022-10-19	EXP Services Inc. / Les Services EXP Inc.	Laval	QC	Industrial	Portable gauge
2022-10-19	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Academic and research	Laboratory studies and consolidated use
2022-10-19	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Medical	Nuclear medicine
2022-10-19	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Medical	Nuclear medicine
2022-10-19	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Medical	Nuclear medicine
2022-10-20	Northriver Testing Ltd.	Mission	BC	Industrial	Portable gauge
2022-10-20	DB Ground Testing Ltd.	Agassiz	BC	Industrial	Portable gauge
2022-10-20	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Academic and research	Laboratory studies and consolidated use
2022-10-20	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Medical	Nuclear medicine
2022-10-20	The Ottawa Hospital / L'Hôpital d'Ottawa	Ottawa	ON	Medical	Nuclear medicine
2022-10-21	Jim Dent Construction Ltd.	Hope	BC	Industrial	Portable gauge
2022-10-21	Terrapex Environmental Ltd.	Nepean	ON	Industrial	Portable gauge
2022-10-21	G2S Environmental Consulting Inc.	Burlington	ON	Industrial	Portable gauge
2022-10-24	Advance Testing Ltd.	Burnaby	BC	Industrial	Portable gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-10-24	Metalogic Inspection Services Inc.	Edmonton	AB	Industrial	Industrial radiography
2022-10-24	Ultratest NDT Services (2010) Inc.	Clairmont	AB	Industrial	Industrial radiography
2022-10-24	Trans Mountain Pipeline ULC	Burnaby	BC	Industrial	Fixed gauge
2022-10-25	J.R. Paine & Associates Ltd.	Grande Prairie	AB	Industrial	Portable gauge
2022-10-25	Aurora Inspections Limited	Sexsmith	AB	Industrial	Industrial radiography
2022-10-25	Howe Sound Pulp & Paper Corporation	Port Mellon	BC	Industrial	Fixed gauge
2022-10-26	Nortech Advanced NDT Ltd.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-26	Buffalo Inspection Services (2005) Inc.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-26	Gunron Inspections Ltd.	Dawson Creek	BC	Industrial	Industrial radiography
2022-10-26	Hudbay Minerals Inc	Flin Flon	MB	Industrial	Fixed gauge
2022-10-26	Alberta Health Services	Calgary	AB	Medical	Nuclear medicine
2022-10-26	Vancouver Coastal Health Authority	New Westminster	BC	Medical	Nuclear medicine
2022-10-26	Alberta Health Services	Calgary	AB	Medical	Nuclear medicine
2022-10-26	Vancouver Coastal Health Authority	New Westminster	BC	Medical	Nuclear medicine
2022-10-27	Intrepid NDE Testing Corp.	Grande Prairie	AB	Industrial	Industrial radiography
2022-10-27	CaNickel Mining Limited	Wabowden	MB	Industrial	Fixed gauge
2022-10-27	Whistler Water Inc.	Burnaby	BC	Industrial	Fixed gauge
2022-10-27	Voltage Wireline Inc.	Grande Prairie	AB	Industrial	Oil-well logging
2022-10-27	Vancouver Coastal Health Authority	Burnaby	BC	Medical	Nuclear medicine
2022-10-27	Vancouver Coastal Health Authority	Burnaby	BC	Medical	Nuclear medicine
2022-10-28	Vancouver Coastal Health Authority	White Rock	BC	Medical	Nuclear medicine
2022-10-28	Vancouver Coastal Health Authority	White Rock	BC	Medical	Nuclear medicine
2022-11-02	Saskatchewan Research Council	Saskatoon	SK	Academic and research	Laboratory studies and consolidated use
2022-11-02	Saskatchewan Research Council	Saskatoon	SK	Academic and research	Laboratory studies and consolidated use
2022-11-02	Saskatchewan Research Council	Saskatoon	SK	Academic and research	Laboratory studies and consolidated use
2022-11-14	Groupe ABS Inc.	Trois-Rivières	QC	Industrial	Portable gauge
2022-11-14	GHD Consultants Ltd.	Rimouski	QC	Industrial	Portable gauge
2022-11-14	Labcan (1989) Ltée	Trois-Rivières	QC	Industrial	Industrial radiography
2022-11-14	Building Products of Canada Corp.	Pont-Rouge	QC	Industrial	Fixed gauge
2022-11-15	Englobe Corp.	Rimouski	QC	Industrial	Portable gauge
2022-11-15	Edward Wong & Associates Inc.	Markham	ON	Industrial	Portable gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-11-15	SNC-Lavalin GEM Québec Inc.	Trois-Rivières	QC	Industrial	Portable gauge
2022-11-15	Syneos Health Clinique Inc	Québec	QC	Academic and research	Laboratory studies and consolidated use
2022-11-15	Compagnie d'Arrimage de Québec Ltée / Quebec Stevedoring Company Ltd.	Québec	QC	Industrial	Fixed gauge
2022-11-15	Honeywell Limited / Honeywell Limitée	Trois-Rivières	QC	Commercial	Servicing
2022-11-15	Honeywell Limited / Honeywell Limitée	Trois-Rivieres	QC	Commercial	Servicing
2022-11-15	Centre intégré de santé et de services sociaux du Bas-Saint-Laurent	Rimouski	QC	Medical	Nuclear medicine
2022-11-15	Centre intégré de santé et de services sociaux du Bas-Saint-Laurent	Rimouski	QC	Medical	Nuclear medicine
2022-11-16	M.C.P.D. Consultants Inc.	Brampton	ON	Industrial	Portable gauge
2022-11-16	Construction DJL Inc./	Shawinigan	QC	Industrial	Portable gauge
2022-11-16	EXP Services Inc. / Les Services EXP Inc.	Trois-Rivières	QC	Industrial	Portable gauge
2022-11-16	Gemtec Consulting Engineers and Scientists Limited	Grand Falls	NB	Industrial	Portable gauge
2022-11-16	Cascades Canada ULC	Témiscouata-sur-le-Lac	QC	Industrial	Fixed gauge
2022-11-16	Université Laval	Québec	QC	Academic and research	Laboratory studies and consolidated use
2022-11-16	Université Laval	Québec	QC	Academic and research	Laboratory studies and consolidated use
2022-11-16	Université Laval	Québec	QC	Academic and research	Laboratory studies and consolidated use
2022-11-17	Pavage Sartigan Ltée	Saint-Georges	QC	Industrial	Portable gauge
2022-11-17	Englobe Corp.	Saint-Georges	QC	Industrial	Portable gauge
2022-11-17	Englobe Corp.	Rivière-du-Loup	QC	Industrial	Portable gauge
2022-11-17	CEGEP de Trois-Rivières	Trois-Rivières	QC	Industrial	Industrial radiography
2022-11-17	Centre intégré de santé et de services sociaux du Bas-Saint-Laurent	Rivière-du-Loup	QC	Medical	Nuclear medicine
2022-11-17	Centre intégré de santé et de services sociaux du Bas-Saint-Laurent	Rivière-du-Loup	QC	Medical	Nuclear medicine

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-11-18	Laboratoire d'expertises de Rivière-du-Loup Inc.	Rivière-du-Loup	QC	Industrial	Portable gauge
2022-11-18	Pavage Centre Sud du Québec Inc.	Thetford-Mines	QC	Industrial	Portable gauge
2022-11-18	Trillium Health Partners	Mississauga	ON	Medical	Nuclear medicine
2022-11-18	Trillium Health Partners	Mississauga	ON	Medical	Nuclear medicine
2022-11-21	Civil ArSa Engineering Inc.	Cambridge	ON	Industrial	Portable gauge
2022-11-21	Titanium Tubing Technology Ltd.	Vermilion	AB	Industrial	Oil-well logging
2022-11-22	Sintra Inc.	Rouyn-Noranda	QC	Industrial	Portable gauge
2022-11-22	Aecon Transportation West Ltd.	Calgary	AB	Industrial	Portable gauge
2022-11-22	Buffalo Inspection Services (2005) Inc.	Whitecourt	AB	Industrial	Industrial radiography
2022-11-22	Buffalo Inspection Services (2005) Inc.	Whitecourt	AB	Industrial	Industrial radiography
2022-11-22	Les Mines Agnico Eagle Ltée / Agnico Eagle Mines Ltd.	Rouyn-Noranda	QC	Industrial	Fixed gauge
2022-11-22	Les Mines Agnico Eagle Ltée / Agnico Eagle Mines Ltd.	Val d'or	QC	Industrial	Fixed gauge
2022-11-22	Cenovus Energy Inc.	Lloydminster	SK	Industrial	Fixed gauge
2022-11-22	Cenovus Energy Inc.	Lloydminster	SK	Industrial	Fixed gauge
2022-11-22	Joseph Brant Hospital	Burlington	ON	Medical	Nuclear medicine
2022-11-22	Joseph Brant Hospital	Burlington	ON	Medical	Nuclear medicine
2022-11-23	GeoTerre Limited	Brampton	ON	Industrial	Portable gauge
2022-11-23	BakosNDT Ltd.	Whitecourt	AB	Industrial	Industrial radiography
2022-11-23	Concord Steel Centre Ltd.	Woodbridge	ON	Industrial	Fixed gauge
2022-11-23	Winpak Portion Packaging Ltd.	Toronto	ON	Industrial	Fixed gauge
2022-11-23	9357-5942 Québec inc.	Lebel-sur-Quévillon	QC	Industrial	Fixed gauge
2022-11-23	Voltage Wireline Inc.	Whitecourt	AB	Industrial	Oil-well logging
2022-11-23	Mirion Technologies (Canberra CA) Ltd.	Concord	ON	Commercial	Distribution
2022-11-23	Mirion Technologies (Canberra CA) Ltd.	Concord	ON	Commercial	Calibration
2022-11-24	SNC-Lavalin GEM Québec Inc.	Val d'Or	QC	Industrial	Portable gauge
2022-11-24	WSP Canada Inc.	Val d'Or	QC	Industrial	Portable gauge
2022-11-24	Sparta Canada Acquisition ULC	Whitecourt	AB	Industrial	Fixed gauge
2022-11-26	Alberta Health Services	Edmonton	AB	Commercial	Isotope production
2022-11-28	SGS Canada Inc.	Lakefield	ON	Industrial	Fixed gauge
2022-11-29	Kubota Materials Canada Corporation	Orillia	ON	Industrial	Industrial radiography
2022-11-29	DGI Geoscience Inc.	Barrie	ON	Industrial	Oil-well logging
2022-11-30	M.J. Davenport & Associates Ltd.	Otonabee	ON	Industrial	Portable gauge

Inspection date	Licensee name	City	Province / State	Sector	Subsector
2022-12-02	Tata Steel Minerals Canada Ltd.	Northwest of Schefferville	NL	Industrial	Fixed gauge
2022-12-05	Activation Laboratories Ltd.	Ancaster	ON	Academic and research	Laboratory studies and consolidated use
2022-12-05	R-Metrics Ltd.	Burlington	ON	Commercial	Calibration
2022-12-05	National Research Council of Canada	Ottawa	ON	Academic and research	Other
2022-12-06	IRISNDT Corp.	Red Deer	AB	Industrial	Industrial radiography
2022-12-12	Southlake Regional Health Centre	Newmarket	ON	Medical	Radiation therapy
2022-12-12	Canadian Cutting & Coring (Toronto) Ltd	Brampton	ON	Industrial	Industrial radiography
2022-12-13	Sintra Inc.	Rivière-du-Loup	QC	Industrial	Portable gauge
2022-12-13	Buffalo Inspection Services (2005) Inc.	Red Deer	AB	Industrial	Industrial radiography
2022-12-13	Candu Energy Inc.	Mississauga	ON	Commercial	Waste nuclear substance
2022-12-19	Omnifission Inc.	Brampton	ON	Commercial	Distribution
2022-12-20	Chevron Canada Limited	Calgary	AB	Industrial	Fixed gauge
2022-12-20	ROFS Canada Ltd.	Whitecourt	AB	Industrial	Oil-well logging
2022-12-21	Pembina Pipeline Corporation	Whitecourt	AB	Industrial	Fixed gauge
2022-12-21	Pembina Pipeline Corporation	Fox Creek	AB	Industrial	Fixed gauge
2022-12-22	Magnum Cementing Services Operations Ltd.	Strathmore	AB	Industrial	Portable gauge

Appendix I: Stakeholder engagement activities

Table 25: Engagement activities in 2022

Date	Audience / Meeting attendees	Type of activity	Topics
January 2022	CNSC / Canadian Radiation Protection Association working group	Virtual meeting	• Introduction of new CNSC member • Approval of terms of reference • New annual compliance report forms • Update on REGDOC-2.5.6, *Design of Rooms Where Unsealed Nuclear Substances Are Used* • Upcoming review of REGDOC-1.6.1, *Licence Application Guide: Nuclear Substances and Radiation Devices*
March 2022	Intermediate and secondary school students	Judge at virtual regional science fair	• N/A
May 2022	Industrial Radiography Working Group (industry reps and CNSC staff)	Virtual meeting	• Regulatory updates • QSA uncertified accessories, manufacturer equipment update • Barrier breach compliance update • Update on the status of *CSA PCP-09: Exposure Device Operator Personnel Certification Guide*
May 2022	Industry groups, members of the International Atomic Energy Agency (IAEA), and representatives from nuclear regulators around the world	In-person meeting	• IAEA's MIRDEC project in Brussels, Belgium ○ Decommissioning medical, industrial, and research facilities
May 2022	Regulators and accelerator users from countries around the world	In-person conference	• Presented "Agile Regulatory Oversight: Adapting Regulations to Accommodate Rapidly Changing Accelerator Technology" at the IAEA's Accelerators for Research and Sustainable Development conference
June 2022	CNSC, Canadian Radiation Protection Association, Canadian Organization of Medical Physicists	C3 Working Group virtual meeting	• Feedback on the service engineer competency profile
June 2022	Accelerator and Class II facility licensees	Virtual town hall	• Service engineer competency profile
July 2022	Medical physicists	Article in *InterACTIONS*, newsletter of the Canadian Organization of Medical Physicists	• CNSC Forum: An Update on the Most Common Non-Compliances Found During Inspection of Class II Facilities
July 2022	Nuclear substance and radiation device licensees	Targeted email	• Information on extremity dosimetry

Date	Audience / Meeting attendees	Type of activity	Topics
July 2022	Canadian Nuclear Laboratories (CNL) Environmental Stewardship Council (municipal officials, community representatives, interested groups, Atomic Energy of Canada Limited, CNSC and CNL)	In-person meeting	• CNSC's role in regulating safe transport of radioactive materials
August 2022	Nuclear substance and radiation device licensees	Targeted email	• Classification of radionuclides: Tungsten-188
September 2022	Dryden Nuclear Forum (approximately 70 attendees)	Combined in-person and virtual session	• Regulatory roles and potential oversight of the proposed nuclear waste management office as it relates to transport
September 2022	English River First Nation (ERFN), Ya' Thi Néné Lands and Resources Office, Métis Nation – Saskatchewan, Kineepik Métis Local (KML)	In-person	• Sharing of information with community members on the Wheeler River Project and the next steps for the environmental assessment • Staff were invited to attend ERFN and KML culture camps
October 2022	CNSC / Canadian Radiation Protection Association working group	Virtual meeting	• New Canadian Radiation Protection Association working group member • REGDOC-2.5.6, *Design of Rooms Where Unsealed Nuclear Substances Are Used* • Canadian Radiation Protection Association comments on the *Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2021* • Canadian Radiation Protection Association instrumentation course • Outreach with new licensees
October 2022	Accelerator and Class II facility licensees and other external stakeholders	In-person Astro conference	• New technology and artificial intelligence in medical radiation therapy
October 2022	Medical physicists	Article in *InterACTIONS*, newsletter of the Canadian Organization of Medical Physicists	• CNSC Forum: *Class II Nuclear Facilities and Prescribed Equipment Regulations*
October 2022	Accelerator and Class II facility licensees and other external stakeholders	Virtual town hall (English and French session)	• Presentation: "Proposal to Amend the *Class II Nuclear Facilities and Prescribed Equipment Regulations*"
October 2022	Industrial Radiography working group	Virtual meeting	• Various topics of mutual interest
November 2022	Nuclear substance and radiation device licensees	Targeted email	• Cost-recovery advisory group representative for oil and gas industry

Date	Audience / Meeting attendees	Type of activity	Topics
November 2022	CNSC, Canadian Radiation Protection Association, Canadian Organization of Medical Physicists	C3 Working Group virtual meeting	• Update on the radiation safety officer certification exam project
November 2022	All radiation protection professionals	In person	• Booth at the International Commission on Radiological Protection 2021+1 conference • Radiation safety and radiological protection
Throughout 2022 (total of 16 sessions)	New licensees (including radiation safety officers and applicant authorities) and CNSC staff	Targeted virtual meeting	• Joint effort between licensing and inspection staff to help educate new licensees on the various aspects of licensing and compliance, including: • review of the issued licence • relevant information/resources available on the CNSC website • overview of the inspection process • overview of the licensing process • reporting requirements • question and answer session
Monthly in 2022	All DNSR licensees	Targeted emails	• Topics covered in the DNSR Digest in 2022: • message from the DG (effect of pandemic on inspections) • changes to the Secretariat • reminder regarding new annual compliance report (ACR) forms • availability of certified prescribed equipment tables on the CNSC website • information for exposure device operators on updated certification guide • cost-recovery fees • who's who in transport • completing dose information in the ACR • cyber security and DNSR licensees • fax outage at the CNSC • contacting the CNSC 101 • implementing amended radiation protection regulations (specifically extremity dosimetry and information to be provided to NEWs) • notice of licence form • *Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2021* (ROR) posted for public comment

Date	Audience / Meeting attendees	Type of activity	Topics
			• CNSC / Canadian Radiation Protection Association / Canadian Organization of Medical Physicists; and CNSC / Canadian Radiation Protection Association working group membership and objectives • labelling requirements • reminder of posting of ROR 2021 for public comment • ACR inventory submission • use of updated forms/documents on the website • everything you ever wanted to know about certification • delays in processing documents in the Records Office • preparing for an inspection • more PDF help

*No formal outreach activities were conducted for WNSLs as they are a small subsector.
**Staff also participate in various international meetings and conferences to share the Canadian/CNSC perspective on topics of interest.

Table 26: Summary of intervention dispositioning

2021 nuclear substances ROR intervenors	Total requests, concerns and comments	Requests, concerns and comments responded to	Notes
Canadian Environmental Law Association	25	25	Offer extended to meet in person
Nuclear Transparency Project	7	7	Offer extended to meet in person; meeting scheduled for September 2023 at the intervenor's request
Canadian Radiation Protection Association	11	11	Offer extended to meet in person

Table 27: Summary of areas of interest of interventions

Areas of interest	Total number of requests, concerns and comments
Report format and contents	7
Reported events	5
Inspection planning and inspector recruitment	5
Availability of data	5
Commission proceedings	4
Outreach and engagement	3
Trends in performance	2
Doses to workers	2
CNSC website postings	2
Risk-informed approach to regulatory oversight	2
Outreach	1
Regulatory references	1
International obligations	1
Enforcement actions	1
ROR review	1
Participant funding	1

Appendix J: Safety performance rating levels

Table 28 explains the transition in the CNSC's rating terminology. Some inspection reports still use the previous rating levels because of the licensing and compliance system in use, but licensees using nuclear substances and radiation devices can expect to see a gradual transition to the new ratings. For the purposes of reporting in this ROR, the previous rating levels have been converted to the new levels. The rating definitions below were updated in 2021 and endorsed by the CNSC management team. The fully satisfactory rating is no longer used.

Table 28: Transition in compliance rating terminology

Previous rating level	Description	New rating level	Description
A and B	Meets expectations	SA	Satisfactory
C	Improvement is required	BE	Below expectations
D	This area is seriously compromised		
E	Breakdown	UA	Unacceptable

Satisfactory (SA)

Licensee meets all of the following criteria:

- Performance meets CNSC staff expectations.
- Licensee non-compliances or performance issues, if any, are not risk-significant.
- Any non-compliances or performance issues have been, or are being, adequately corrected.

Below expectations (BE)

One or more of the following criteria apply:

- Performance does not meet CNSC staff expectations.
- Licensee has risk-significant non-compliance(s) or performance issue(s).
- Non-compliances or performance issues are not being adequately corrected.

Unacceptable (UA)

One or both of the following criteria apply:

- The risk associated with a non-compliance or performance issue is unreasonable.
- At least one significant non-compliance or performance issue exists with no associated corrective action.

Appendix K: Relevant documents

K.1 Act and regulations

- *Nuclear Safety and Control Act*
- *Administrative Monetary Penalties Regulations*
- *Class II Nuclear Facilities and Prescribed Equipment Regulations*
- *General Nuclear Safety and Control Regulations*
- *Nuclear Substances and Radiation Devices Regulations*
- *Packaging and Transport of Nuclear Substances Regulations, 2015*
- *Nuclear Security Regulations*
- *Radiation Protection Regulations*
- *Nuclear Non-proliferation Import and Export Control Regulations*
- *Canadian Nuclear Safety Commission Cost Recovery Fees Regulations*
- *Transportation of Dangerous Goods Act, 1992* (Transport Canada)
- *Transportation of Dangerous Goods Regulations* (Transport Canada)

K.2 Regulatory documents

- REGDOC-1.4.1, *Licence Application Guide: Class II Nuclear Facilities and Prescribed Equipment*
- REGDOC-1.5.1, *Application Guide: Certification of Radiation Devices or Class II Prescribed Equipment*
- REGDOC-1.6.1, *Licence Application Guide: Nuclear Substances and Radiation Devices*
- REGDOC-1.6.2, *Radiation Protection Programs for Nuclear Substances and Radiation Devices Licences*
- REGDOC-2.2.2, *Personnel Training*
- REGDOC-2.2.3, *Personnel Certification: Radiation Safety Officers*
- REGDOC-2.2.3, *Personnel Certification: Exposure Device Operators* (and the associated CSA PCP-09: *Exposure Device Operator Personnel Certification Guide*)
- REGDOC-2.5.5, *Design of Industrial Radiography Installations*
- REGDOC-2.5.6, *Design of Rooms Where Unsealed Nuclear Substances Are Used*
- REGDOC-2.5.7, *Design, Testing and Performance of Exposure Devices*
- REGDOC-2.7.1, *Radiation Protection*
- REGDOC-2.7.2, *Dosimetry, Volume I: Ascertaining Occupational Dose*
- REGDOC-2.9.1, *Environmental Principles, Assessments and Protection Measures*
- REGDOC-2.11, *Framework for Radioactive Waste Management and Decommissioning in Canada*
- REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste*
- REGDOC-2.11.2, *Decommissioning*
- REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material*
- REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*
- REGDOC-2.13.2, *Import and Export*
- REGDOC-2.14.1, *Volume I: Information Incorporated by Reference in Canada's* Packaging and Transport of Nuclear Substances Regulations, 2015
- REGDOC-3.1.3, *Reporting Requirements for Waste Nuclear Substance Licensees, Class II Nuclear Facilities and Users of Prescribed Equipment, Nuclear Substances and Radiation Devices*
- REGDOC-3.2.1, *Public Information and Disclosure*
- REGDOC-3.2.2, *Indigenous Engagement*
- REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities*
- REGDOC-3.5.2, *Compliance and Enforcement: Administrative Monetary Penalties*

- REGDOC-3.5.2, *Compliance and Enforcement, Volume II: Orders Under the Nuclear Safety and Control Act*
- REGDOC-3.5.3, *Regulatory Fundamentals*
- REGDOC-3.6, *Glossary of CNSC Terminology*

Other relevant documents

- RD-364: *Joint Canada–United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages* (2009)