



26-M6 - CNSC Staff Submission

Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2024

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Summary	This Commission member document (CMD) presents the Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2024. Through inspections, reviews and assessments, Canadian Nuclear Safety Commission staff have concluded that licensees in the medical, industrial, academic and research, and commercial sectors made adequate provisions to protect the health, safety and security of persons and the environment.
Actions required	There are no actions requested of the Commission. This CMD is for information only.



CMD 26-M6

Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2024

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Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2024

Canadian Nuclear Safety Commission

Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2024

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Changes since last review

Change	Rationale
Added a section on why the environmental protection safety and control areas (SCA) is not highlighted in the report for licensees other than waste nuclear substance licensees.	Interventions on past regulatory oversight reports (RORs) regularly questioned why this area is not covered in the report.
Added information in the reportable events section including describing how CNSC staff review event reports, adding details in the event summaries related to root causes and corrective actions and including a separate section on transport events.	Intervenors on past RORs have regularly shown interest on this topic and have raised questions related the number and type of events included in this report.
Incorporated information on why data related to the equivalent doses to extremities and to the skin is not included in the report.	The exclusion of this information was questioned by an intervenor on the 2023 ROR.
Introduced the updated risk ranking of regulatory requirements in the radiation protection safety and control area which will be used during inspections conducted in 2025.	Staff want to ensure that the rankings reflect the actual risk and that the Commission is aware of the changes that will be seen in future RORs.
Added additional information about waste nuclear substance licences to the description of the commercial sector.	This was done in response to a comment from an intervenor on the 2023 ROR.

Land acknowledgement

Licensees covered by this report are located across Canada, and CNSC staff acknowledge all relevant treaties and all traditional territories on which the licensees are situated.

Plain language summary

The *Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2024* provides information on licensee use of nuclear substances in the medical, industrial, academic and research, and commercial sectors. Most of these licensees are regulated by the Canadian Nuclear Safety Commission's (CNSC) Directorate of Nuclear Substance Regulation (DNSR). The regulatory oversight report (ROR) also includes a very small number of 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.

Based on their assessment of licensee performance results for 2024, 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.

As in previous RORs, the report includes specific information on compliance efforts and additional outreach and communication activities undertaken by the CNSC to address continued compliance issues in the radiation protection safety and control area of the medical sector. Staff has also looked at the very conservative methodology used for rating in this area and is implementing changes in this methodology as staff are confident that despite the apparent poor compliance in this area, licensees are in fact operating safely.

Responsiveness and transparency are key elements of the CNSC's commitment to building trust in the nuclear regulator. CNSC staff contacted all intervenors on the 2023 ROR individually to respond to their comments directly and in more detail than during the Commission proceeding in November 2024. Due to the ongoing interest from intervenors in the environmental protection SCA and in the section on reportable events, additional information was incorporated on these topics in this ROR.

This report also continues to be the mechanism to update the Commission on the status of Mississauga Metals & Alloys Inc. (MM&A).

Based on licensee performance in 2024, CNSC staff can 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 across all

safety and control areas, and the associated non-compliances were corrected in a timely manner.

- Effective doses to workers remain low.
- Escalated enforcement actions are used when deemed necessary to ensure safety and security.
- More than 97% of reported events were 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 are key to openness and transparency.

Overall, in 2024, 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.

Referenced documents in this CMD are available to the public upon request, subject to confidentiality considerations.

1 Report Overview

1.1 Background

Each year, the Canadian Nuclear Safety Commission (CNSC) publishes regulatory oversight reports, which offer information on the safety performance of Canadian licensees who are authorized to use nuclear substances. The reports evaluate licensees based on their safety procedures and adherence to regulatory policy. Key issues and emerging changes in regulation are also highlighted.

[Learn more about regulatory oversight reports](#)

1.2 Scope of report

This regulatory oversight report describes the regulatory oversight and safety performance of licensees who use nuclear substances in the medical, industrial, academic and research, and commercial sectors. These sectors are further broken down into subsectors for the purposes of reporting as follows:

Medical:

- Nuclear medicine
- Radiation therapy
- Veterinary nuclear medicine

Industrial:

- Portable gauge
- Fixed gauge
- Industrial radiography
- Oil-well logging

Academic and research:

- Laboratory studies and consolidated use

Commercial:

- Isotope production
- Processing of nuclear substances
- Distribution
- Servicing
- Calibration
- Waste nuclear substances

The report summarizes the safety performance of 1,447 licensees holding a total of 2,034 licences. In addition to the standard review of performance indicators, the 2024 ROR also includes an overview of the licensing process and information related to safeguards and other international commitments. The 2024 ROR also provides an update on compliance and outreach efforts in the medical sector and on the ongoing situation at Mississauga Metals & Alloys Inc. Lastly, the report provides the Commission with information about outreach and 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.

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](#).

1.3 Regulatory oversight

This ROR presents a set of 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

The CNSC uses a risk-informed regulatory approach to these activities, applying resources and regulatory oversight commensurate with the risk associated with the regulated facility and activity.

2 Licensing overview

This section provides an overview of the licensing process for licences covered by this report. High-quality assessments help ensure that licensees have strong programs in place. These programs play a key role in supporting licensee performance and provide the foundation of compliance oversight.

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 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. Licensees must inform the CNSC of any changes to their approved programs.

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. In addition, the CNSC's [REGDOC-1.4.1, Licence Application Guide: Class II Nuclear Facilities and Prescribed Equipment](#) and [REGDOC-1.6.1, Licence Application Guide: Nuclear Substances and Radiation Devices](#) provide guidance on the information to be submitted in support of an application. While there is no specific licence application guide for waste nuclear substances, applicants must comply with the requirements as laid out in the applicable regulations noted above.

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 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 are commensurate with the risk of the licensed activity.

For licence renewals, 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.

The information required to amend a licence during the licence period will vary depending on the change requested. Each amendment request is reviewed with the same risk-informed lens as any application.

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 high volume of licensing decisions and the relatively low risk to the public of the licensed activities, the Commission has authorized DOs to make licensing decisions related to the licensees covered in this report. Additional information about designated officer decisions can be found in [appendix B](#).

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.

3 Inspection overview

Regular inspections verify that licensees are complying with regulatory requirements and the conditions of their licence as well as verifying that licensees have implemented the radiation safety programs approved by the CNSC. In this way, the CNSC can ensure that licensees are operating safely and adhering to their licence conditions.

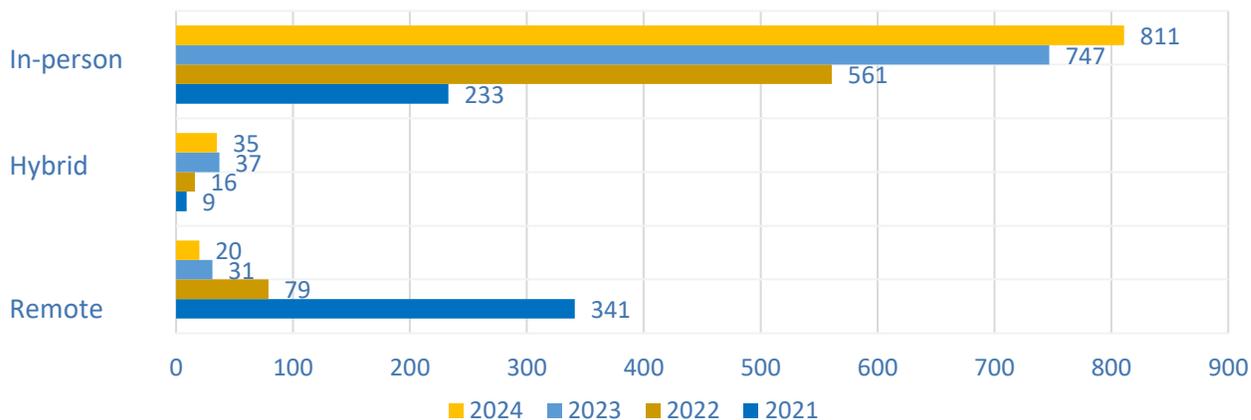
The inspection planning process used by CNSC staff takes a risk-informed approach that prioritizes inspections by applying a baseline inspection frequency and taking into account other factors, such as declining performance. This process was described in detail in [section 2.0 of the 2021 ROR](#).

Inspections in 2024 included a mix of remote, in-person and hybrid inspections. In 2024, staff performed 866 inspections (811 in-person, 35 hybrid and 20 remote). CNSC staff performed 51 more inspections in 2024 compared to 2023. The total number of inspections performed in 2024 is in line with the number of inspections performed pre-pandemic when 863 inspections were performed in 2019. Staff can confirm that progress continues towards achieving baseline inspection frequencies. The number of licensees overdue for inspection is gradually decreasing and continues to be dependent on inspector resources. While overdue inspections are prioritized, it is about balancing these with other priorities including licensees in poor performing subsectors and those performing high risk activities.

A summary of all inspections performed can be found in [appendix C](#). A full list of all inspection performed can be found on the [Open Government portal](#). Figure 1 shows the transition in the types of inspections performed from 2021 to 2024, with the number of in-person inspections increasing and the number of remote inspections decreasing. Staff see this as a positive trend;

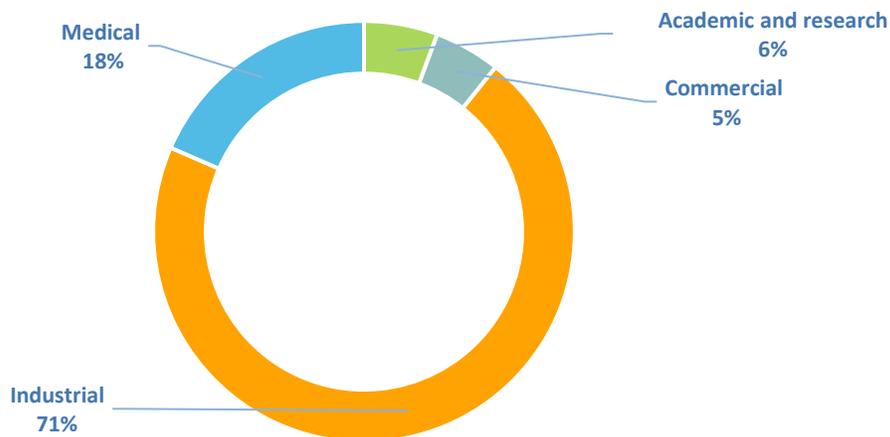
while remote inspections are a useful tool, CNSC staff believe that, in most cases, onsite inspections are the preferred option.

Figure 1: Comparison of the types of inspections performed from 2021 to 2024



Most of the inspections (89%) 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 2024



Licensees must comply with regulatory requirements whether they are subject to a CNSC inspection or not, nevertheless inspections remain an important component of regulatory oversight that allow the CNSC to verify licensee compliance with those requirements. They also provide an opportunity for inspectors to intervene early with specific licensees when performance starts to decline.

While inspections are important, they are not the only regulatory oversight tool available to the CNSC to assess licensee compliance. Throughout 2024, CNSC staff also reviewed annual compliance reports submitted by licensees and followed up on notifications and reportable 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 earlier in the [licensing overview](#) section of this report.

CNSC staff followed up on 14 external complaints that involved 13 different licensees covered by this report. In response to these complaints, where appropriate, inspections were carried out by CNSC staff right away or were added to the inspection plan for a future inspection. Escalated enforcement was used if necessary. Although not all external complaints against licensees resulted in an inspection, each complaint was investigated by CNSC staff. In all cases, where contact details were available, CNSC staff contacted the complainants and performed follow-up to ensure concerns were addressed.

Considering the full suite of licensing and compliance activities, the increase in the number of inspections in 2024, as well as the ability to prioritize the most risk significant inspections, CNSC staff are confident in their regulatory oversight of licensees covered by this report.

[Learn more about The CNSC's approach to compliance verification and enforcement](#)

4 Compliance overview

4.1 Compliance framework

To measure licensee performance, CNSC staff use the well-established Safety and Control Area Framework as described in [appendix D](#). 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

covered by this report, 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 E](#).

4.2 Overall compliance results

A total of 5 unacceptable ratings, as [defined by the CNSC](#), were issued in 2024. Three unacceptable ratings were issued in the radiation protection SCA, 1 in the operating performance SCA, and 1 in the security SCA. The unacceptable ratings were issued to 5 different licensees: 3 in the medical sector and 2 in the industrial sector. Additional information on these unacceptable ratings, including actions taken by CNSC staff, can be found in the [SCA assessment section](#). No unacceptable ratings were issued in the SCAs not covered in this report.

Overall licensee performance has remained relatively stable over the past 5 years in all SCAs covered by this report. At the sector and subsector level, there is some variation: some areas continue to see lower or declining performance, while others show improving performance. A brief overview of the performance in the key SCAs is provided starting in the [SCA assessment section](#), with more details provided in [appendix F](#). [Appendix G](#) presents the inspection results by subsector, offering another perspective on licensee performance in 2024.

In all cases, where items of non-compliance were identified or where escalated enforcement action was used, CNSC staff verified that licensees took appropriate corrective actions.

Before discussing compliance performance trends in greater detail, it is important to provide some context to assist in interpreting performance data.

Inspection follow-up

When interpreting compliance performance data, it is important to bear in mind that the data reported in the ROR reflects the licensee's performance at the time of inspection. The ratings included in this report are ratings issued as part of the inspection process and not ratings issued after corrective actions have been taken. They are a "point in time" rating. This is a unique way

of reporting in the RORs as this ROR is the only one that reports ratings from individual inspections. In all other RORs, they are rating a licensee's performance and programs based on a full year of oversight. This point in time way of reporting can make it appear as if the performance of licensees covered by this report is worse than other CNSC licensed facilities.

Following an inspection, 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 is compliant).

Any improvements in performance will not be reflected in the ROR until that licensee is next inspected. Inspection frequency varies with the risk ranking of the licensed activity. In most cases, licensees are only inspected every 3-5 years with only the higher risk activities being inspected more frequently. Year-over-year trending in the ROR is therefore not reflective of individual licensee performance.

Calculating an SCA rating

When considering the performance data summarized in this report, it is important to understand how an SCA rating is reached. This topic was covered in detail in [section 3.0](#) of the *Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2022*. One of the key points to remember is that the overall SCA ratings are based on the ratings given to each individual regulatory requirement. With the current rating methodology, a single high-risk requirement that receives a below expectation rating will drop the overall performance in that SCA to below expectations. This conservative approach impacts the overall trends at the sector and subsector level and may give the impression that licensee's programs are ineffective or their activities unsafe. A below expectations rating in any SCA as the result of a single inspection does not necessarily point to a failure in the licensee's programs or indicate unsafe work practices.

While considering how best to explain why CNSC staff is not concerned with licensee performance overall despite continued low performance in the radiation protection SCA, specifically in the nuclear medicine subsector, staff have taken a step back to look at the approach currently used to rate this SCA. The radiation protection SCA is disproportionately affected by this conservative approach for 2 reasons:

- there are more requirements deemed as high risk, especially for unsealed source users
- the amendments to the *Radiation Protection Regulations* led to an increase in the total number of requirements in this SCA; non-compliances with the new requirements were causing a significant decrease in the radiation protection SCA ratings.

The next section outlines CNSC staff's plans for a different approach to communicating risk in this SCA, to better account for these disproportionate effects.

Future changes to rating and communicating license performance in the radiation protection SCA

As noted in the previous section, our conservative approach to rating individual non-compliances has a disproportionate effect on the nuclear medicine sub-sector, with respect to radiation protection. The result is that the performance ratings presented in past RORs have inaccurately overstated the safety significance of non-compliances. To correct this miscommunication, CNSC staff have reviewed the risk-ranking of all line items (regulatory requirements) in the radiation protection SCA and have revised the rankings to more accurately reflect the risk. This is not about changing the goalposts, but rather about improving the accuracy of our evaluations so that they better reflect the true safety performance of licensees.

During this review, staff considered the risk of non-compliance for each requirement, including the probability and severity, and documented the rationale for each change. Prior to the review, there were 26 high-risk requirements, 3 medium-risk requirements and 1 low-risk requirement. As a result of this review, 10 high-risk items were changed to medium-risk, leaving 13 requirements at the high-risk ranking. The 10 requirements are ones where the non-compliances most reported are minor and not risk significant. As an example, one of the items that was changed from high-risk to medium-risk is the requirement for labelling of containers with the radiation warning symbol. On a routine inspection of a nuclear medicine department, an inspector might see dozens of containers holding radioactive material. If even one of these containers was missing a label, or even if a label was incomplete or illegible, the citation would have caused the entire SCA to be below expectations. Now that it is a medium-risk item, only serious or repeat non-compliances under this regulatory requirement will trigger a lowering of the SCA; for example, if the inspector sees multiple containers unlabelled or if they deem the lack of a label to be a significant risk. Regardless of whether the citation lowers the overall SCA or not, the non-compliance is recorded in the inspection report, and the licensee is required to submit corrective measures.

Major and risk-significant issues continue to be recorded under high-risk line items, and serious or repeat non-compliances in a medium-risk item will result in an SCA that is below expectations. Requirements related to overall radiation protection program management, dose ascertainment and certain key licensed activities, such as industrial radiography or high-dose in-patient therapies, remain as high-risk. The changes are consistent across all subsectors but will reduce the disproportionate effect that the conservative grading system has on unsealed source users (such as nuclear medicine licensees). With these changes, the number of non-compliances will not change however there will be a lower probability of a single non-compliance lowering the overall SCA performance to a below expectations rating.

These updated rankings were implemented in June 2025, so starting in the 2025 ROR, staff anticipate that the radiation protection SCA ratings will see an increase in satisfactory ratings.

CNSC staff want to reiterate that these changes are being made to more accurately reflect the actual risk. All instances of non-compliance will still be recorded and corrected. Poor performers will still be identified and escalated enforcement actions will be used when necessary to bring licensees back into compliance. While no impacts are seen in this ROR, staff felt it was important to introduce these changes to set the stage for the 2025 ROR.

Additional considerations

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 2024, only 5 unacceptable ratings were issued across all SCAs. Additional information on these unacceptable ratings, including actions taken by CNSC staff, can be found in the [SCA assessment section](#).

5 Assessment of safety and control areas

5.1 Management system

Total inspections performed: 807

In 2024, all sectors performed well in this SCA, with 97% 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 F](#) and [appendix G](#) for additional information.

5.2 Operating performance

Total inspections performed: 828

In 2024, overall licensee performance in this SCA remained stable, with 85% of inspections yielding satisfactory ratings, which is comparable to the 5-year average of 86%. This stability was also noted at the subsector level when compared to ratings in 2023 with some subsectors showing improvement in 2024.

In the industrial sector, the fixed gauge subsector has continued to show a slight upward trend in this SCA after a few years of declining performance prior to 2023. While most non-compliances in this subsector are administrative in nature, staff continue to remind licensees of their obligations with respect to following procedures referenced in their licence.

There was 1 unacceptable rating in this SCA related to a licensee in the portable gauge subsector. [Order 1264](#) was issued in response to the inspection. The licensee complied with the terms of the order to the satisfaction of the CNSC and the order was closed.

Refer to [appendix F](#) and [appendix G](#) for additional information.

5.3 Radiation protection

Total inspections performed: 842

Overall, the percentage of inspections resulting in a satisfactory rating in 2024 was 77% which is comparable to the 5-year average of 79%.

There were 3 unacceptable ratings issued in this SCA. Escalated enforcement actions were taken in response to these ratings.

[Order 1275](#) was issued to a nuclear medicine licensee prohibiting the licensee from using, transferring, importing or exporting radioactive material until they can demonstrate that management control of the radiation safety program is effectively implemented. In May 2025 CNSC staff made a recommendation to the Commission that their licence be revoked, as the licensee was no longer operating. On July 29, 2025, pursuant to section 25 of the NSCA, the Commission revoked the licence, effectively closing this order.

[Order 1167](#) was issued to a portable gauge licensee in response to inspection findings and remains open at the writing of this report. To date, the licensee has not submitted corrective actions that are sufficient to close the order. Staff continued to follow-up with the licensee and prioritized them for a follow-up inspection in 2025/2026. At this inspection, sufficient progress had not been made to close the order and CNSC staff placed security seals on all the portable gauges and on the storage enclosure which will be removed when the order is closed.

Finally, a request was made under subsection 12(2) of the [General Nuclear Safety and Control Regulations](#) to a licensee in the radiation therapy subsector who received an unacceptable rating in this SCA. This action is further discussed in the [enforcement section](#).

Refer to [appendix F](#) and [appendix G](#) for additional information.

5.3.1 Radiation protection SCA in the medical sector

Overall, the medical sector once again saw low ratings with 56% of inspections being given a satisfactory rating in this SCA. In 2024, 92% of inspections performed in the radiation therapy subsector achieved satisfactory ratings. Although no veterinary nuclear medicine licensees achieved a satisfactory rating in this SCA, due to the small number of inspections (only 2 in 2024), it is difficult to draw any conclusions about the subsector overall. The nuclear medicine subsector however only achieved a satisfactory rating in 51% of inspections in 2024.

As described in detail in the [2023 ROR on the Use of Nuclear Substances in Canada](#), and in the specific [briefing](#) (CMD 24-M23) on this topic presented to the Commission in May 2024, CNSC staff have put significant effort in working with this sector, with a focus on the nuclear medicine

subsector, to address licensee performance in this SCA. CNSC staff also increased the number of inspections in this sector overall with a specific focus on the nuclear medicine subsector with 43 more inspections being done in 2024 compared to 2023. With this increase in the number of inspections, it is not surprising that more non-compliances were identified.

The radiation protection SCA in the medical sector has been an ongoing area of focus for the CNSC, particularly in the nuclear medicine subsector, in part due to the ratings achieved in this SCA in the past few years. As a reminder, the rating algorithm used is very conservative so it is difficult to draw conclusions on overall subsector performance based on ratings alone. As explained above, in the current rating system, a single non-compliance can lower the overall rating of the SCA to a below expectations rating. A single non-compliance does not necessarily mean a loss of control over the radiation protection program and accordingly, it should not impact on the overall rating to such an extent. Notwithstanding this conservatism, CNSC staff continue to prioritize addressing performance in this subsector.

Most non-compliances in this SCA continue to be related to the updated [Radiation Protection Regulations](#). Specifically, most non-compliances continue to be related to the following issues:

- Licensee's failure to meet requirements related to contamination meters
- Licensee's failure to demonstrate that the sampling and counting methods used by the licensee meets the licence criteria for detecting loose contamination
- Requirements related to extremity monitoring

In order to support licensees in achieving fewer non-compliances, as mentioned in the 2023 ROR, an article was included in the DNSR Digest in 2023 on expectations for contamination monitoring equipment calibration and, also in 2023, the CNSC posted the webinar on the requirements for contamination meter calibration and methods for establishing detection efficiency. In 2024, the DNSR Digest was again leveraged with articles on extremity monitoring requirements and the requirement to inform nuclear energy workers of their radiation dose levels.

CNSC staff also met with the [Canadian Radiation Protection Association](#) (CRPA) and the [Canadian Association of Medical Radiation Technologists](#) (CAMRT), which is the national professional association and certifying body for radiological, nuclear medicine and magnetic resonance imaging technologists and radiation therapists, to discuss the performance of the nuclear medicine subsector in the radiation protection SCA. An outcome of these discussions was the creation of a webinar offered by CAMRT but facilitated by CNSC staff entitled [CNSC: Update on Radiation Protection Regulations & Non-Compliance Issues](#).

As described in the [section](#) on the future changes to rating and communicating licensee performance in the radiation protection SCA, CNSC staff will be amending the safety significance of a number of line items (or regulatory requirements) to better reflect the actual risk. If these changes had been implemented in 2024, about 79% of the nuclear medicine

licensees would have received a satisfactory rating in this SCA instead of the 51% using the current risk ranking of regulatory requirements. This information is included simply to show the impact this change will have moving forward.

In 2024, doses for all workers in the nuclear medicine subsector remained low. Additionally, there were no risk-significant events reported to the CNSC for this subsector and no trends of repeated events by the same licensee. Most non-compliances identified by inspectors were corrected to the satisfaction of CNSC staff and where they weren't, enforcement actions were implemented.

Based on an assessment of all performance metrics and the current conservative nature of applying a rating to the SCA, CNSC staff conclude that despite an apparent downward trend in the radiation protection SCA ratings, nuclear substances in the nuclear medicine subsector are used safely. Moving forward, staff will continue to monitor licensee performance in the medical sector and will continue to prioritize inspections in the nuclear medicine subsector.

5.4 Security

Total inspections performed: 790

Nuclear substance licensees maintained high levels of compliance with the security requirements. In 2024, 94% of licensees inspected in this SCA received satisfactory ratings. Although there was some fluctuation between sectors, overall, the rate has remained stable and consistent with the 5-year average of 93%.

There was 1 unacceptable rating in this SCA. This rating was issued to a licensee in the radiation therapy subsector due to multiple weaknesses in the security program. This was the first inspection after the implementation of an approved security plan since the implementation of REGDOC-2.12.3: [Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material](#). Multiple notices of non-compliance with short deadlines were issued and the licensee addressed them shortly after the inspection. As a result of this rating, security inspections have been prioritized in 2025/26 for licensees in this subsector who have not had a security inspection since the implementation of the REGDOC.

Refer to [appendix F](#) and [appendix G](#) for additional information.

5.5 Conventional health and safety

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 may need to be mitigated.

Consistent with previous years, in 2024, all WNSLs received a satisfactory rating 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.

Refer to [appendix F](#) for additional information.

5.6 Environmental protection

5.6.1 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.

Consistent with previous years, in 2024, all WNSLs received a satisfactory rating in the environmental protection SCA. The WNSLs continued to manage and monitor environmental releases relating to licensed activities.

There were no events reported in 2024 that involved releases to the environment.

Refer to [appendix F](#) for additional information.

5.6.2 Other nuclear substance licensees

Performance results in the environmental protection SCA for nuclear substance licensees are not typically included in the ROR, since those licensees have minimal to no interactions with the environment. In response to questions raised by intervenors on previous RORs, CNSC staff are providing a more fulsome explanation of the rationale for excluding this SCA from the report.

CNSC staff apply [REGDOC-2.9.1, *Environmental Principles, Assessments and Protection Measures*](#), when reviewing applications for nuclear substance licences to ensure that there are no significant interactions with the environment. These licences generally cover activities involving the use of sealed or unsealed sources.

For sealed sources (e.g., fixed or portable gauges used in the industrial sector that contain sealed sources), the analysis performed led staff to conclude that there are no routine

interactions with the environment and that, therefore, there is no need for an environmental risk assessment and little to assess under the environmental protection SCA.

Less than one third of the licences (just over 600) covered by this report are authorized to handle unsealed nuclear substances. Most of these licences are in the medical sector where radioisotopes are produced or used for diagnostic or therapeutic purposes. For unsealed sources, a higher chance of interaction with the environment does exist. This could involve, for example, releases from the stacks of isotope processing facilities or the disposal of small amounts of medical isotopes to the landfill or the sewer. For these licensees, CNSC staff apply the requirements in [REGDOC-2.9.1, *Environmental Principles, Assessments and Protection Measures*](#) and in [REGDOC 2.9.2, *Controlling Releases to the Environment*](#) in a graded approach.

In general, for licences authorizing the use of unsealed nuclear substances, the following apply with respect to disposal or releases:

- standard exemption quantity (EQ) and unconditional clearance levels specified in Schedules 1 and 2, respectively, of the [Nuclear Substances and Radiation Devices Regulations](#)
- generic conditional clearance levels (CCLs) documented in REGDOC 2.9.2, *Controlling Releases to the Environment*, provided that releases occur only through the specified pathway (i.e., solids to municipal landfill, gases to atmosphere, liquid to municipal sewer)
- practice-specific conditional clearances, which are CCLs applicable only to a defined practice or activity and which have been developed by the CNSC for application to multiple licensees carrying out the specific practice or activity; they are generally included as a condition on a licence

The activities and/or concentrations associated with the above criteria were derived from conservative public exposure risk assessment modelling (using dose criteria associated with *de minimis* risk $\sim 10 \mu\text{Sv}/\text{year}$).

Since the majority of licensees covered by this ROR do not use unsealed sources as part of their licensed activities, reporting on this SCA would not be effective in providing an overall indication of the safety performance of the licensees covered by this report. Licensees that use unsealed sources must, however, have programs in place to ensure that they meet any release limits imposed on them, and program implementation is verified during inspections and desktop reviews. If applicable, any unacceptable ratings would be discussed in this report more fully. Any events involving releases would be summarized in the table of events in [appendix J](#).

CNSC staff conclude that the oversight of the environmental protection SCA for nuclear substance licensees and the assessment and controls put in place for environmental protection for the industry are such that there is no additional benefit to highlighting performance in this SCA for all licensees covered in this report.

6 Enforcement

[Appendix H](#) presents enforcement action data by sector over the past 5 years and includes a list of all orders and administrative monetary penalties (AMPs) issued in 2024.

A graduated approach to enforcement is used to restore compliance when necessary. Multiple factors, such as the severity of the non-compliance and the associated risk, are considered in applying judgement to determine the most appropriate enforcement strategy for a given situation. Orders and AMPs are the most common escalated enforcement tools used by CNSC staff. [REGDOC-3.5.2, Compliance and Enforcement, Volume II: Orders Under the Nuclear Safety and Control Act](#) provides information about making, receiving, reviewing, appealing and redetermining orders pursuant to the NSCA and its regulations. [REGDOC-3.5.2, Compliance and Enforcement: Administrative Monetary Penalties](#) describes where AMPs fit into the CNSC's approach to enforcement and provides an overview of how AMPs are administered.

Most enforcement actions are issued because of findings during inspections. While orders can be issued by inspectors, designated officers or the Commission, in 2024, all orders were issued by inspectors. All AMPs issued in 2024 were issued by CNSC designated officers who were authorized to issue notices of violation. Enforcement actions are posted on the CNSC's [regulatory actions web page](#) as they are issued.

In 2024, CNSC staff issued 9 orders and 4 AMPs to licensees covered under this report. The majority, 8 orders and 3 AMPs, were issued to licensees in the industrial sector, which is consistent with trends in previous years. One order was issued to a licensee in the medical sector and 1 AMP was issued to an individual working for a medical sector licensee. All 9 orders and 3 of the 4 AMPs were issued in response to inspections. The final AMP was issued in response to events reported to the CNSC. In 7 of the 9 orders, the licensees complied with the terms of the orders to the satisfaction of the CNSC and the orders were closed. The order issued to the medical sector licensee was closed after the Commission revoked the licence pursuant to section 25 of the NSCA. One order remains open and will be followed until closed. All 4 AMPs were paid as required.

There are other enforcement tools available to CNSC staff although orders and AMPs are the most used. For example, in 2024, CNSC staff conducted reactive inspections at a medical sector licensee. These were carried out as a follow-up to previous inspections where non-compliances were identified. The increased inspection frequency was part of an escalated enforcement approach. There was continued and significant non-compliance with regulatory requirements found during these reactive inspections. In response to concerns that insufficient resources were allocated to the radiation protection program, the CNSC issued a [request for information](#) under subsection 12(2) for the [General Nuclear Safety and Control Regulations](#). The licensee

responded to the request with all the required information by the timeline specified in the request.

Overall, the number of enforcement actions issued was stable compared to 2023 and the numbers are still low in comparison to the number of inspections performed and the number of events reported. Of the 866 inspections performed and the 194 events reported, on only 14 occasions was escalated enforcement deemed necessary which supports CNSC staff's assessment that licensee performance remains acceptable.

7 Doses to workers

[Appendix I](#) presents the full datasets, as well as additional information, on effective doses to workers reported in 2024. 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 effective doses to their workers as part of their annual compliance reports (ACRs). In 2024, doses were reported for 52,172 workers in the 4 sectors. Of those workers, 22,330 were nuclear energy workers (NEWs). The remaining 29,842 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 2024, consistent with previous reporting years.

Based on the doses reported on in 2024, no NEWs received effective doses above the regulatory effective dose limit of 50 mSv per one-year dosimetry period. A licensee in the nuclear medicine subsector did report that 1 NEW received an effective dose of 20.48 mSv, which is unusual for that subsector. According to records, most of the dose was received in a single quarter. An investigation by the licensee revealed that it was likely the result of the worker not respecting the ALARA principle by not following internal procedures for a specific task. The licensee put corrective actions in place and reminded staff of the importance of using available shielding.

Of the 29,842 non-NEWs for which doses were reported in the ACRs, there were 8 reported effective doses above the regulatory limit of 1 mSv/year.

A licensee reported that a non-NEW working in the portable gauge subsector appeared to have received an effective dose of 4.94 mSv which was not in line with the work performed. An investigation into the dose concluded that the dose was non-personal as the dosimeter was found in a storage area where multiple gauges were stored. The licensee began the paperwork

to request a dose change however they were not able to reach the worker, who has since left the company. The licensee will keep the paperwork in case the individual ever gets back in contact with them.

Another portable gauge subsector licensee reported in their ACR that a non-NEW received an effective dose of 3.27 mSv. The dose report from Health Canada indicated an anomaly that was related to a non-uniform exposure of the dosimeter. The investigation performed by the licensee revealed that the worker never actually wore their dosimeter. It was stored 24 hours a day, right next to the portable gauge storage area. The licensee indicated their intention to submit a dose change request, but the request had not been submitted at the time of writing this report.

There were two events that involved unplanned exposures to non-NEWs in 2024. In 1 case, the licensee submitted a report in 2024 indicating that 6 non-NEW workers were inadvertently exposed to radiation due to improper storage conditions of their portable gauges over a 3-year period (2021-2023). The highest effective dose estimate for each year was 4.73 mSv. An [event initial report](#) (CMD 24-M32) was presented to the Commission in September 2024. The licensee has since reconfigured the storage area and added additional shielding to ensure there is not recurrence of this situation. The second event is more fully described in the next section, but since the dose data always lags by one year, the actual dose related to this event will be reported in the 2025 ROR. There were no adverse health and safety consequences, or appreciable increased risks, associated with these unplanned exposures.

Licensees are also required to ascertain and record equivalent doses to the skin and extremities to demonstrate to the CNSC that they are being kept below the equivalent dose limits. Licensees also report on these doses in their ACRs, which are reviewed by CNSC staff. In most instances, the effective dose is reflective of the dose to the skin and extremities. More than two thirds of licensees covered by this report are not handling sources directly or are working at a distance from the sources. The nature of the work means that the effective dose would be reflective of the dose to the skin and extremities. However, there are workers, such as those who handle unsealed sources directly, whose effective dose is not reflective of the dose to the skin or extremities. These individuals represent a small group within all the Nuclear Energy Workers (NEWs) for whom doses are being reported and these doses reflect the nature of the work being performed. They are not generally a reflection of the licensee's control over the radiation safety program. CNSC staff do not believe there would be significant value in adding any additional dose data to the ROR. Any overexposures of the skin or hands/feet (extremities) must be reported to the CNSC and would be reported in the ROR; and in certain instances, to the Commission through an Event Initial Report. There were no exceedances in 2024.

Overall, there was strong performance in all sectors in 2024, with effective doses to all workers remaining generally low and stable year over year.

8 Reportable events

[Appendix J](#) provides data on the types of events reported over 5 years and provides a summary of each event reported in 2024.

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. When a licensee submits a preliminary report about an event, CNSC staff ensure that the situation is under control and that measures are taken to mitigate the event. The event is entered into a CNSC database, and the event number is assigned. Each event is tracked to ensure that the root cause of the event is identified, and that measures are put in place to prevent a recurrence where possible. The event is considered closed when the final report from the licensee has been reviewed and deemed to be complete by CNSC staff. CNSC staff also look for trends in event reporting and respond appropriately if any significant trends are noted. For example, in 2024, it was noted that there were several events in the industrial sector related to shutters on fixed and portable gauges and to accidents involving portable gauges on construction sites. In response to this trend, CNSC staff published an article in the DNSR Digest in early 2025 with information about these events and guidance on how to avoid them. In the case of lost, stolen or found nuclear substances, CNSC staff take additional actions including posting this information on the CNSC website and notifying external stakeholders.

CNSC staff also have the authority to use escalated enforcement actions if an event is deemed to pose an immediate risk to health and safety or the environment and the licensee does not appear to be taking appropriate corrective actions. CNSC staff may also consider enforcement actions or increased regulatory oversight when there are repeated events by the same licensee. For example, a specific security inspection was planned for a medical sector licensee who had repeated security-related events.

CNSC staff rate each reportable event using the [International Nuclear and Radiological Event Scale \(INES\)](#), a 7-point scale for consistently communicating the safety significance of nuclear and radiological events to the public. 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 defense in depth).

CNSC staff assessed 194 events related to nuclear substances and prescribed equipment in 2024. Of those events, 188 were rated as INES level 0. The remaining 6 were rated as INES level 1. Three of these INES level 1 events were related to the theft of portable gauges. (event IDs [6193](#), [6347](#) and [6469](#)) In 2 of the 3 cases, the gauges were recovered. In the third case, the gauge is still 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. A portable gauge is categorized as Category 4, based on internationally established standards as described in the IAEA's [Categorization of Radioactive Sources](#). This means that this radioactive material is classified as "low risk" and is unlikely to be dangerous.

Two INES level 1 rated events were related to unplanned exposures of non-NEWs. In 1 case, 6 non-NEW workers were inadvertently exposed to radiation due to improper storage conditions of their portable gauges. (event ID [6278](#)) This event was more fully described above in section 7 of the report. These effective doses are captured in the dose data discussed in section 7 since the doses were received in over the 2021-2023 period.

In the second case, a non-NEW nurse, working with a child who underwent an I-131 in-patient therapy, received an effective dose of 1.27 mSv while caring for the child who was a high-needs patient. (event ID [6397](#)) This effective dose will be captured in the dose data that will be presented in the 2025 ROR as doses received in 2024 are reported on in the following year's ROR.

There were no adverse health and safety consequences, or appreciable increased risks, associated with any of these unplanned exposures.

The final INES level 1 rated event involved a licensee in the academic and research sector who reported the loss of a package containing a static eliminator. (event ID [6521](#)) The package was subsequently found in another department after multiple searches.

While there has been a slight increase in reportable events in 2024 with 194 reported in 2024 compared to the 184 reported in 2023, due to the nature of the events and the number of licensees covered by this report, CNSC staff are not concerned with this slight increase. In fact, staff are encouraged by the reporting culture of licensees as this may be an overall indicator of a strong safety culture amongst licensees.

At a December 2023 Commission proceeding, staff presented an event initial report ([CMD 23-M51.A](#)) related to inaccuracies between paper records and actual thyroid screening tests for staff in a nuclear medicine department. As a result of this notification, and as mentioned in the [enforcement section](#), an [AMP](#) was issued to an individual in February 2024. The AMP was subsequently paid by the individual. At the Commission's request, CNSC staff provided an [update](#) (CMD 24-M34) in September 2024 discussing the extent to which the records were falsified and the potential impacts on families of workers who missed thyroid screening. As

described in that update, there were no anticipated impacts to the families of workers who missed their thyroid screening.

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.

8.1 Reportable events related to transport

The [Packaging and Transport of Nuclear Substances Regulations, 2015](#) define what is considered a dangerous occurrence and the steps that must be taken when such an event occurs, including reporting to the CNSC. Amongst other things, events reportable to the CNSC include:

- a conveyance carrying a radioactive material is involved in an accident (no matter the seriousness of the accident)
- a package shows damage, tampering or leakage of its contents (regardless of the extent)
- radioactive material escapes from its containment system, package or conveyance during transport
- radioactive material is lost, stolen or misplaced during transport.

Intervenors have regularly shown an interest in the number of reportable events related to the transport of nuclear substances, with a specific interest in motor vehicle collisions. CNSC staff felt it was important to put this number in context.

Based on a study performed by the CNSC, approximately 760,000 shipments of nuclear substances are transported to, from and within Canada every year. Approximately 95% of these (about 722,000) are routine shipments of nuclear substances used for medical, industrial, academic and research, and commercial applications. Table 1 lays out a summary of the transport-related events in these 4 sectors. Any events related to transport that fall outside of the 4 sectors covered by this report are not discussed here but would be covered under the applicable regulatory oversight report.

Table 1: Summary of events related to the packaging and transport of nuclear substances

Total number of reportable events related to transport	61
Number of reports related to motor vehicle collisions	47
<ul style="list-style-type: none"> • Only 1 package was reported as being damaged when involved in a motor vehicle collision. (minor dents) 	

Number of reports related to packages showing damage, tampering of leakage of its contents	11
Number of reports related to improper packaging or labelling	3
Number of events that resulted in a release to the environment	0
Number of events that resulted in a radiological risk to persons	0



The safety of transport is in the packages used. For example, even when there is significant damage to the vehicle, as seen in the image, the package and its contents (high activity sealed sources used in well-logging) were undamaged.

While the number of reportable events related to packaging and transport may seem high, when compared to the number of

shipments that are carried out each year, it is a very small number. None of these events resulted in a release to the environment or a radiological risk to persons.

9 Consultation and engagement

9.1 Indigenous consultation and engagement

The common-law duty to consult with Indigenous Nations and communities applies when the Crown contemplates actions that may adversely affect potential or established Indigenous and/or treaty rights. The CNSC ensures that all of its licence decisions under the NSCA uphold the honour of the Crown and consider Indigenous peoples' potential or established Indigenous and/or treaty rights pursuant to section 35 of the Constitution Act, 1982.

The Manitoba Métis Federation (MMF) and the Kebaowek First Nation (KFN) intervened on the 2023 ROR presented to the Commission in November 2024. Interventions from MMF and KFN raised concerns regarding regulatory oversight and safety performance in areas such as packaging and transport, environmental protection and on waste management and decommissioning. In addition, intervening Indigenous Nations called upon the CNSC to evaluate all SCAs as part of compliance activities and to ensure the conformance of oversight with the

principles of the United Nations Declaration on the Rights of Indigenous Peoples. After the Commission meeting, CNSC staff reached out to both groups and provided written responses to their questions and comments. CNSC staff also offered to meet with both groups to discuss the responses or to address general questions about the nuclear substances program. At the time of writing this report, neither group had requested to meet with staff about licensees covered in this report.

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 licences covered in this ROR.

Outside of recent interest in the ROR, Indigenous Nations and communities have not expressed a specific interest in licensed activities covered by the nuclear substances program. However, CNSC staff have participated in general outreach activities with Indigenous Nations and communities to provide information on the packaging and transport of nuclear substances.

9.2 Public consultation and engagement

The NSCA mandates the CNSC to disseminate objective scientific, technical and regulatory information to the public concerning its activities and the activities it regulates. CNSC staff fulfill this mandate in a variety of ways, including hosting in-person and virtual information sessions and through annual regulatory reports.

The CNSC carries out engagement and outreach activities to facilitate communication on licensed activities and regulatory requirements. 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 requirements.

In 2024, outreach was done through a combination of virtual and in-person sessions and through written communications. Outreach included participation in town hall sessions, webinars, monthly 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. [Appendix K](#) includes a complete list of outreach and engagement activities undertaken in 2024.

In addition to these outreach and engagement opportunities, after the presentation of the 2023 ROR on the use of nuclear substances in November 2024, in addition to contacting Manitoba Métis Federation and Kebaowek First Nation, CNSC staff reached out to other interested parties who took the opportunity to comment on the ROR through the intervention

process: Radiation Safety Institute of Canada, 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 them to discuss the responses if needed. At the time of writing this report, none of the intervenors had requested a specific meeting with CNSC staff. [Appendix L](#) summarizes the number of comments responded to and the number of comments by area of interest submitted by the intervenors for the 2023 ROR.

Staff are committed to continued openness and transparency with licensees and all other interested parties.

9.3 Participant Funding Program

The Canadian Nuclear Safety Commission (CNSC) established the Participant Funding Program (PFP) in 2011 to:

- enhance individual, not-for-profit organization and Indigenous Nations and Communities participation in the CNSC's environmental assessment (EA) and licensing processes for major nuclear facilities (e.g., uranium mines, nuclear power plants, nuclear substance processing, or nuclear waste facilities);
- assist individuals, not-for-profit organizations and Indigenous Nations and Communities to bring value-added information to the Commission through informed and topic-specific interventions (i.e., new, distinctive and relevant information that contributes to a better understanding of the anticipated effects of a project).

The CNSC offered participant funding to review and submit comments to the Commission on CNSC staff's 5 regulatory oversight reports (RORs) for the 2024 calendar year, including this report. The details of this offering can be found in the online announcement, [here](#). Once the funding decision has been made by the CNSC, this online announcement will be updated with the list of funding recipients.

10 Other matters of regulatory interest

10.1 Update on Mississauga Metals & Alloys Inc.

Mississauga Metals & Alloys, Inc. (MMA), a former WNSL, declared bankruptcy on August 20, 2021. Since this time, staff has provided updates regarding MMA to the Commission as part of the annual Regulatory Oversight Report on the Use of Nuclear Substances in Canada.

Following the issuance of a Designated Officer Order in 2023, the Commission reviewed and revoked the Order and issued its Record of Decision. The key direction in this decision to CNSC staff was as follows:

- Proceed with the characterization of the nuclear substances
- Access and use the existing financial guarantee towards the characterization of the nuclear substances
- Update the Commission on a regular basis

CNSC staff are in the process of addressing the Commission's decision on this matter. In 2024, CNSC staff applied for authorization from the Ontario Superior Court of Justice to undertake investigatory and characterization steps with respect to the MMA Site. This would allow the CNSC to have legal site authority over the MMA site to proceed with the characterization of the nuclear substances. This authorization was granted in January 2025.

CNSC staff has also retained the services of Public Services and Procurement Canada (PSPC) to manage the procurement process associated with the MMA site and is working with them to determine the best procurement approach. The first phase of the work, a structural assessment of the trailers on site to be able to safely complete the detailed characterization of the nuclear substances, is anticipated to commence in 2025.

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.

10.2 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. Materials subject to safeguards 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 2024, the IAEA performed 6 inspections at the facilities of nuclear substance licensees to confirm licensees' declarations on the possession and use of nuclear material. The IAEA reported that the results of these inspections were all satisfactory.

CNSC staff have been working on improving safeguards reporting on small quantities of nuclear material used at research institutions and at industrial locations. The CNSC's Location Outside Facilities (LOFs) creation initiative, which aimed to build awareness with licensees and a commitment to reporting of small quantities, is now complete and the IAEA was informed of this in early 2024. Staff will continue to monitor for any new LOFs.

Finally, CNSC staff will continue to ensure that licensees implement all the measures required to meet Canada's international obligations.

11 Conclusions

In 2024, most inspected licensees were compliant 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, and all enforcement actions issued are followed to closure. Effective doses 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 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.

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.

Industrial

Industrial applications of nuclear substances are as varied as the processes to which they are applied. In most cases, licensees in the industrial sector use nuclear substances either in industrial facilities or as part of fieldwork or construction. In these applications, nuclear

substances are often incorporated in radiation devices. Fixed nuclear gauges, monitor production processes in many industries and are often used for level and flow rate measurements in these processes. Portable nuclear gauges are often used to measure moisture and density in soil and the compaction of asphalt in road construction.

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.

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 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

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.

Academic and research facilities may be authorized to use any nuclear substance that they request be added to their licence. It is not unusual for an academic and research licensee to have dozens of nuclear substances listed on their licence.

Commercial

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.

In the commercial sector, the range of nuclear substances authorized for use is large and varies depending on the activity. Most of the nuclear substance processing licences would involve the use of medical isotopes (e.g., Technetium-99m, Iodine-131, Fluorine-18, Thallium-201, Indium-111, Iodine-125, Lutetium-177) whereas the servicing licences would generally include sealed sources, radiation devices, and/or class II prescribed equipment depending on what they are permitted to service. Again, the list of nuclear substances in each of these pieces of equipment varies greatly. Some of these licensees will have only a few items they are licensed to service while others will have dozens. Distribution licences again could include anything depending on what they are licensed to distribute—this could include sealed sources, unsealed sources or prescribed equipment. Calibration licences authorize the use of sealed sources or prescribed equipment—some of the most common calibrators contain Cs-137.

Waste nuclear substance licensees:

- manage waste such as contaminated metals, laundry, tooling and equipment, gloves, paper towels, liquid scintillation vials, etc. from nuclear power plants, fuel cycle facilities and research laboratories
- must maintain a waste inventory below 10^{15} becquerels (Bq) and must only process or use nuclear substances at a quantity below 10^{15} Bq per calendar year; if these levels are exceeded, a Class IB licence is required
- are classified as low-risk facilities based on the types of hazards that exist, annual throughput and inventory quantities of nuclear substances, potential exposures to the public and the environment, as well as the complexity of the operations

Additional information about the licensed activities covered by this report can also be found in a [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. Additional information on waste nuclear substance licences is also available on the CNSC [website](#).

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.

B1: Designated officer decisions

CNSC designated officers made a total of 2,038 licensing and certification decisions related to activities covered in this report in 2024. The majority of these were licensing decisions, as shown in table 2.

Table 2: Designated officer licensing and certification decisions in 2024, all sectors combined

Type of decision	Number of decisions
Licensing (issuance of new licences, licence renewals, licence amendments, licence revocations and licence transfers)	1,521
Certification of prescribed equipment (radiation devices, Class II prescribed equipment, and transport packages)	56
Certification of exposure device operators (issuance of new certifications and renewal of certifications)	443
Certification of Class II radiation safety officers	18
Total	2,038

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.

B2: Licensing

In 2024, there were 1,982 nuclear substances and prescribed equipment licences held by 1,403 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 licensees headquartered outside of Canada service prescribed equipment located in Canada, while others have operational facilities in Canada.

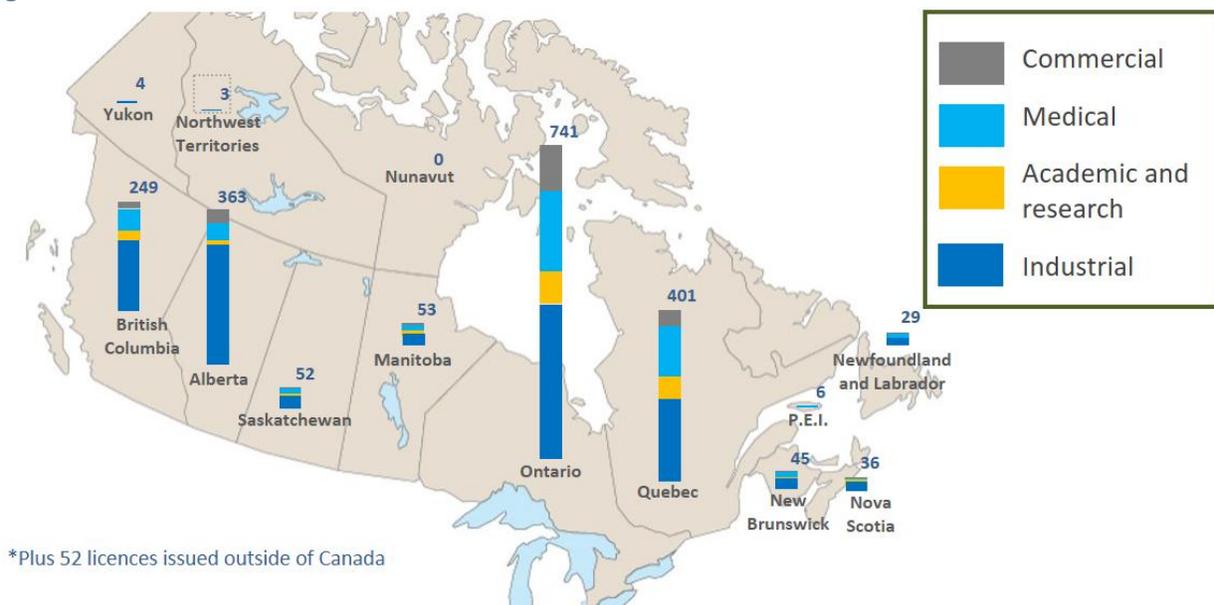
The disparity between the number of licences and the number of licensees can be explained by the fact that while most licensees perform a single licensed activity and therefore require only one CNSC licence, others perform varied activities that require a licence for each one. For example, a hospital 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 2](#) of this ROR.

Table 3: Number of licences by sector, 2020 to 2024

Sector	2020	2021	2022	2023	2024
Medical	445	440	443	449	452
Industrial	1,207	1,221	1,205	1,180	1,152
Academic and research	189	187	185	185	182
Commercial	238	249	247	244	248
Total	2,079	2,097	2,080	2,058	2,034

Figure 3: Licence distribution



B3: 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 2, designated officers made 56 decisions related to the certification of prescribed equipment in 2024 compared to 102 in 2023. This variation year-to-year is somewhat expected as the number of certificates that expire, and the number of new applications vary each year.

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. In November 2022, staff presented the [certification process for prescribed equipment](#) to the Commission.

B4: 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 2024, the CNSC certified 111 new exposure device operators (EDOs) and renewed the certifications of 332 others, compared to 2023 when the CNSC certified 125 new EDOs and renewed 352 certifications. In 2024, EDO Certification staff met with industry in May at the industrial radiography annual meeting.

CSA Group's : [CSA PCP-09: Exposure Device Operator Personnel Certification Guide – Revision 1](#), provides guidance on the recommended procedures to achieve and renew an EDO personnel certification. Additional information on the EDO program can be found on the [CNSC website](#).

B5: 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 2024, the CNSC certified 18 Class II RSOs which is a decrease over the 20 certified in 2023. As in 2023, no Class II RSOs were decertified in 2024. In 2024, CNSC staff refused to certify 1 RSO applicant. The designated officer based their refusal on the results of the certification examination.

Appendix C: Summary of inspections conducted in 2024

The following tables provide a summary of inspections performed in 2024. A full list of all inspections performed on licences covered by this report in 2024 can be found on the [Open Government portal](#). An overview of inspections in 2024 can be found in [section 3](#) of this report.

Note that where a province is not listed in the following tables, no inspections were performed in that province.

Table 4: Number of inspections performed in 2024 by sector in each province

Province	Academic and research	Commercial	Industrial	Medical	Total of inspections
Alberta	8	7	211	18	244
British Columbia	9	5	77	17	108
Manitoba	1	3	24	6	34
New Brunswick	2	0	11	2	15
Newfoundland	0	1	2	3	6
Nova Scotia	0	0	19	4	23
Northwest Territories	0	0	1	0	1
Ontario	22	17	172	67	278
Quebec	4	10	68	41	123
Saskatchewan	3	1	26	2	32
Yukon	0	0	1	0	1
Outside of Canada	0	0	1	0	1

Table 4a: Number of inspections performed in the academic and research sector in 2024 by subsector in each province

Province	Lab studies and consolidated use	Other	Total
Alberta	8	0	8
British Columbia	9	0	9
Manitoba	1	0	1
New Brunswick	2	0	2
Ontario	19	3	22
Quebec	4	0	4
Saskatchewan	3	0	3

Table 4b: Number of inspections performed in the commercial sector in 2024 by subsector in each province

Province	Calibration	Distribution	Isotope production Acc.	Processing of Nuclear substances	Servicing	Waste Nuclear Substance	Other	Total
Alberta	2	2	1	0	2	0	0	7
British Columbia	0	0	1	3	0	0	1	5
Manitoba	1	0	1	0	1	0	0	3
Newfoundland	0	0	1	0	0	0	0	1
Ontario	3	3	1	1	4	2	3	17
Quebec	0	4	2	0	3	0	1	10
Saskatchewan	0	0	1	0	0	0	0	1

Table 4c: Number of inspections performed in the industrial sector in 2024 by subsector in each province

Province	Fixed Gauge	Industrial Radiography	Oil well Logging	Portable Gauge	Other	Total
Alberta	50	74	22	62	3	211
British Columbia	15	3	1	56	2	77
Manitoba	9	3	0	10	2	24
New Brunswick	1	1	0	9	0	11
Newfoundland	0	2	0	0	0	2
Nova Scotia	4	6	0	8	1	19
Northwest Territories	1	0	0	0	0	1
Ontario	39	32	2	93	6	172
Quebec	27	8	0	33	0	68
Saskatchewan	12	1	0	13	0	26
Yukon	0	0	0	1	0	1
Outside of Canada	0	0	1	0	0	1

Table 4d: Number of inspections performed in the medical sector in 2024 by subsector in each province

Province	Diagnostic and therapeutic nuclear medicine	Radiation Therapy	Vet. Nuclear medicine	Other	Total
Alberta	14	2	2	0	18
British Columbia	11	1	0	5	17
Manitoba	4	1	0	1	6
New Brunswick	2	0	0	0	2
Newfoundland	2	1	0	0	3
Nova Scotia	4	0	0	0	4
Ontario	58	6	0	3	67
Quebec	35	5	0	1	41
Saskatchewan	2	0	0	0	2

Appendix D: Safety and Control Area Framework

The following table provides a high-level definition of each SCA.

Functional Area	Safety and Control Area	Definition
Management	Management system	Covers the framework that establishes the processes and programs required to ensure an organization achieves its safety objectives, continuously monitors its performance against these objectives and fosters a healthy safety culture.
Management	Human performance management	Covers activities that enable effective human performance through the development and implementation of processes that ensure a sufficient number of licensee personnel are in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties.
Management	Operating performance	Includes an overall review of the conduct of the licensed activities and the activities that enable effective performance.
Facility and equipment	Safety analysis	Covers maintenance of the safety analysis that supports the overall safety case for the facility. Safety analysis is a systematic evaluation of the potential hazards associated with the conduct of a proposed activity or facility and considers the effectiveness of preventive measures and strategies in reducing the effects of such hazards.
Facility and equipment	Physical design	Relates to activities that impact the ability of structures, systems and components to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.
Facility and equipment	Fitness for service	Covers activities that impact the physical condition of structures, systems and components to ensure that they remain effective over time. This includes programs that ensure all equipment is available to perform its intended design function when called upon to do so.

Core control processes	Radiation protection	Covers the implementation of a radiation protection program in accordance with the Radiation Protection Regulations . The program must ensure that contamination levels and radiation doses received by individuals are monitored, controlled and maintained ALARA.
Core control processes	Conventional health and safety	Covers the implementation of a program to manage workplace safety hazards and to protect workers.
Core control processes	Environmental protection	Covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.
Core control processes	Emergency management and fire protection	Covers emergency plans and emergency preparedness programs that exist for emergencies and for non-routine conditions. This area also includes any results of participation in exercises.
Core control processes	Waste management	Covers internal waste-related programs that form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. This area also covers the planning for decommissioning.
Core control processes	Security	Covers the programs required to implement and support the security requirements stipulated in the regulations, the licence, orders, or expectations for the facility or activity.
Core control processes	Safeguards and non-proliferation	Covers the programs and activities required for the successful implementation of the obligations arising from the Canada/International Atomic Energy Agency (IAEA) safeguards agreements, as well as all other measures arising from the <i>Treaty on the Non-Proliferation of Nuclear Weapons</i> .
Core control processes	Packaging and transport	Covers programs for the safe packaging and transport of nuclear substances to and from the licensed facility.

Appendix E: Safety Performance Rating Levels

Table 5 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.

Table 5: 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	BE	Below expectations
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:

- 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 F: Compliance performance

This appendix provides details regarding licensee compliance with additional details provided on the SCAs determined to be the most relevant in providing an overall indication of the safety performance of licensees in 2024. An overview of licensee compliance can be found in [section 4](#) of this report.

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 2024, only 5 unacceptable ratings were issued across all SCAs.

In all cases, for any below expectations or unacceptable ratings, CNSC staff ensured that licensees took appropriate corrective actions. Escalated enforcement was used when deemed necessary.

Data related to the [environmental protection](#) and the [conventional health and safety](#) SCAs is only included for WNSL in this section.

F1: Management system

Of the 807 inspections that looked at the management system SCA, 97% 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 6 compares the 2024 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, 2020 to 2024

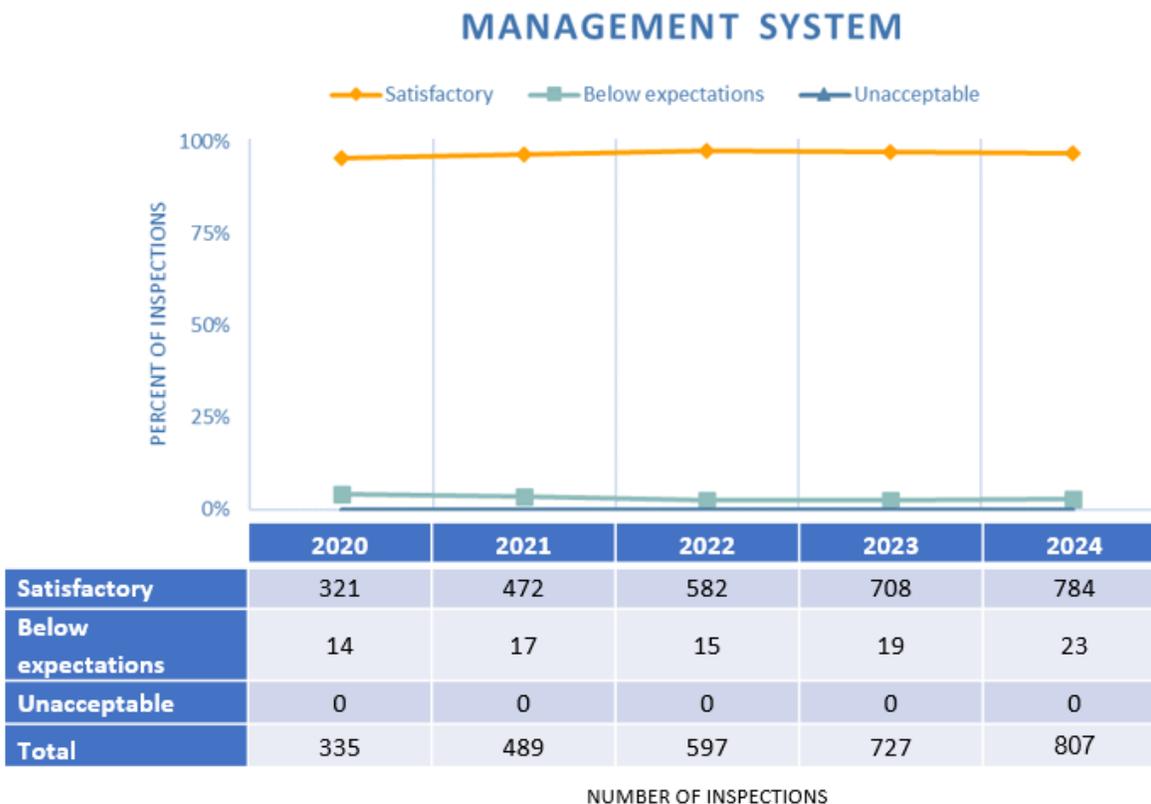


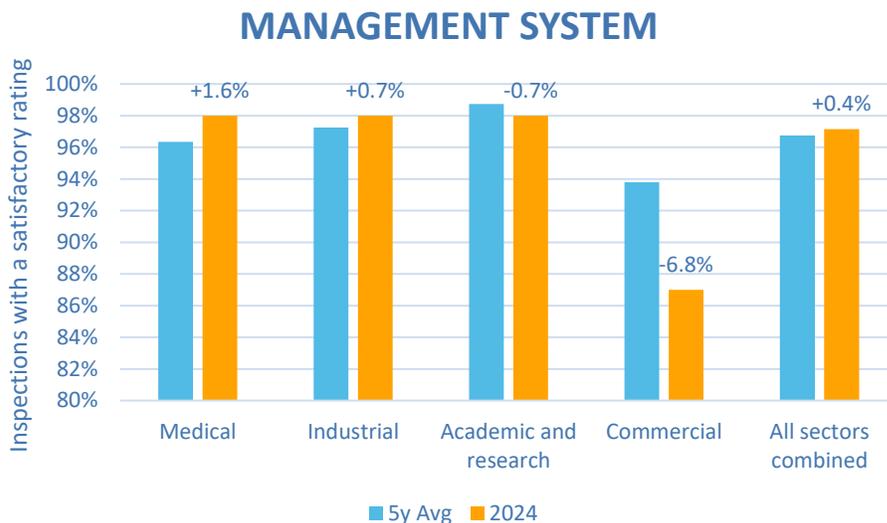
Figure 5: Sector-by-sector comparison of satisfactory inspection ratings for the management system SCA, 2020 to 2024



	2020	2021	2022	2023	2024
Medical	44	101	93	87	129
Industrial	254	329	427	497	580
Academic and research	9	18	33	76	43
Commercial	14	24	29	48	32
All sectors combined	321	472	582	708	784

Number of inspections with a satisfactory rating

Figure 6: Sector-by-sector comparison of satisfactory inspection ratings for the management system SCA, 2024 versus the 5-year average (2020 to 2024)



F2: Operating performance

Of the 828 inspections that looked at the operating performance SCA, 88% of the licensees inspected demonstrated that adequate processes and programs were in place to achieve their safety objectives and therefore received satisfactory ratings (figures 7 and 8). Figure 9 compares the 2024 ratings to the 5-year average by sector.

There was 1 unacceptable rating in this SCA issued to a licensee in the portable gauge subsector. Order 1264 was issued in response to the inspection. The licensee complied with the terms of the order to the satisfaction of the CNSC and the order was closed. Additional details on the orders can be found in [appendix H](#).

Figure 7: Inspection ratings for the operating performance SCA, 2020 to 2024

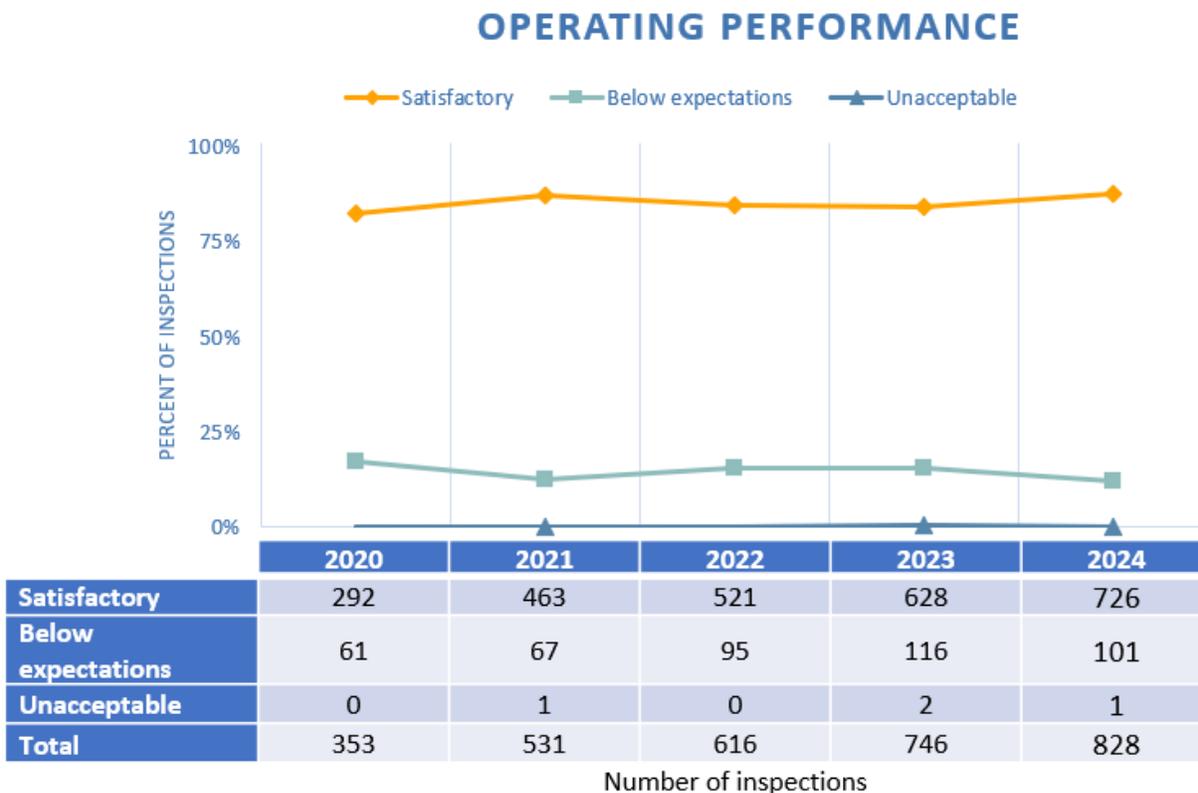


Figure 8: Sector-by-sector comparison of satisfactory inspection ratings for the operating performance SCA, 2020 to 2024

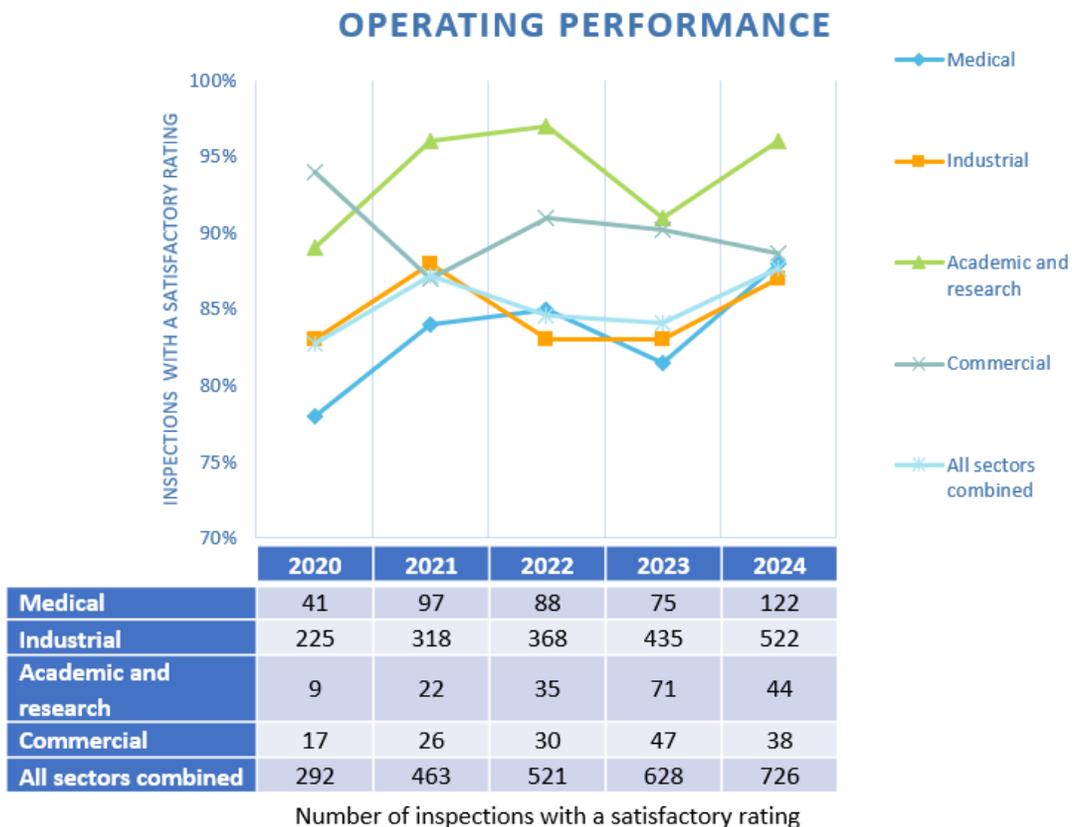
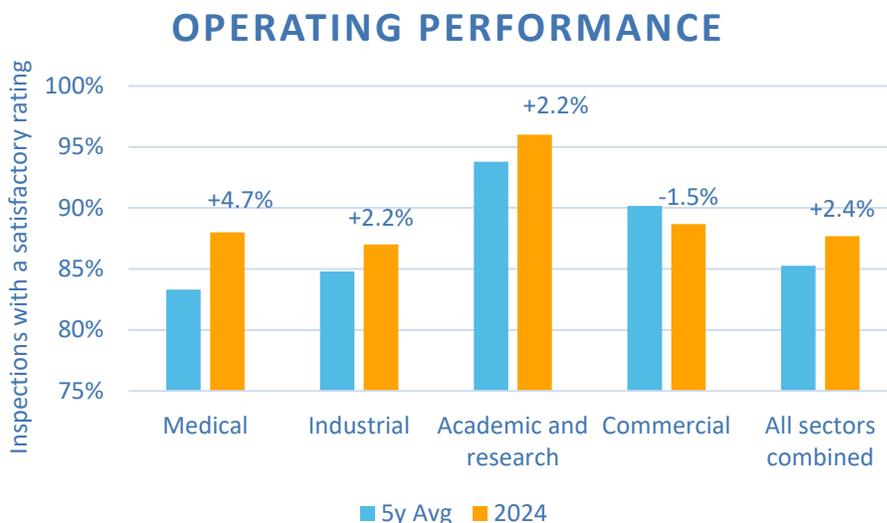


Figure 9: Sector-by-sector comparison of satisfactory inspection ratings for the operating performance SCA, 2024 versus the 5-year average (2020 to 2024)



F3: Radiation protection

Of the 842 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 10 and 11). Figure 12 compares the 2024 ratings to the 5-year average by sector.

There were 3 unacceptable ratings issued in this SCA. Order 1275 was issued to a nuclear medicine licensee and order 1167 was issued to a portable gauge licensee in response to these findings. Order 1167 remains open. Additional details on these orders can be found in [appendix H](#). The third unacceptable rating was issued to a licensee in the radiation therapy subsector and

resulted in a request under subsection 12(2) of the [General Nuclear Safety and Control Regulations](#). Additional details on this action can be found in the [enforcement](#) section.

Figure 10: Inspection ratings for the radiation protection SCA, 2020 to 2024

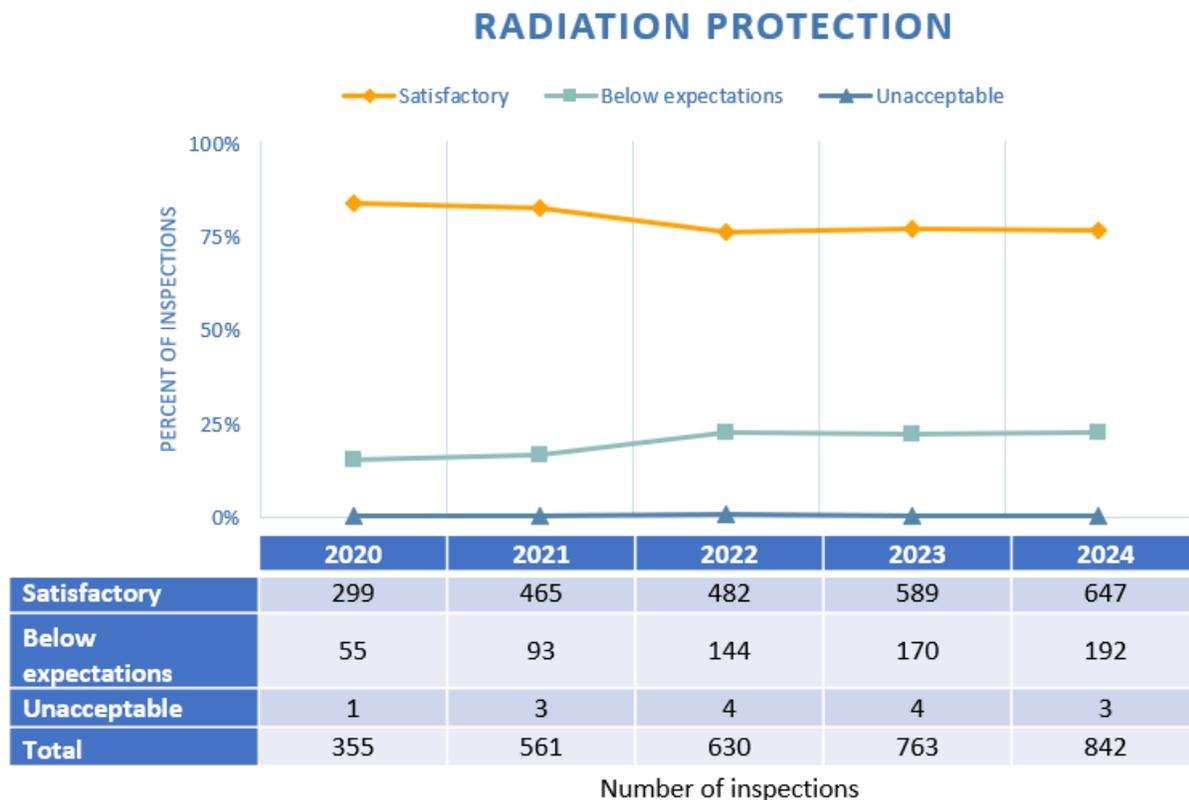


Figure 11: Sector-by-sector comparison of satisfactory inspection ratings for the radiation protection SCA, 2020 to 2024

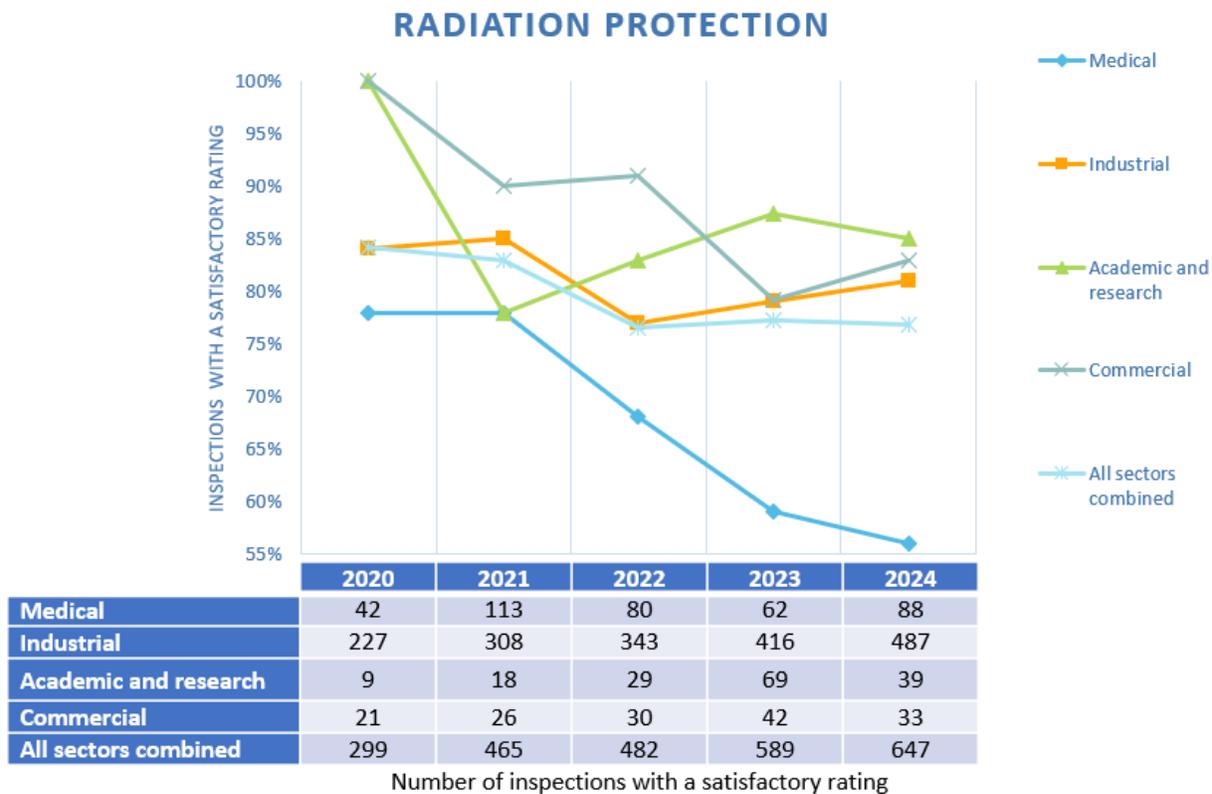
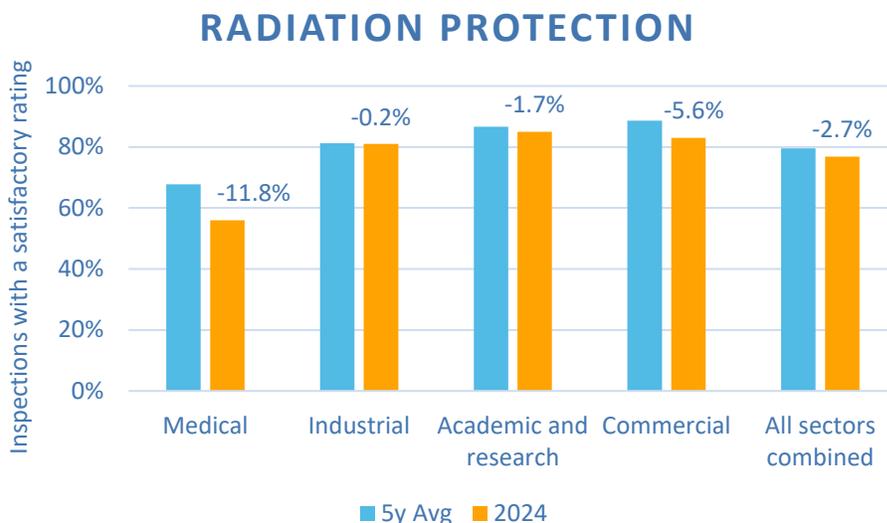


Figure 12: Sector-by-sector comparison of satisfactory inspection ratings for the radiation protection SCA, 2024 versus the 5-year average (2020 to 2024)



F4: Security

Of the 790 inspections that looked at the security SCA, 94% of the licensees inspected demonstrated that adequate processes and programs were in place to achieve their safety objectives and therefore received satisfactory ratings (figures 13 and 14). Figure 15 compares the 2024 ratings to the 5-year average by sector.

There was 1 unacceptable rating in this SCA. This rating was issued to a licensee in the radiation therapy subsector due to multiple weaknesses in the security program. Multiple notices of non-compliance with short deadlines were issued and the licensee addressed them shortly after the inspection.

Figure 13: Inspection ratings for the security SCA, 2020 to 2024

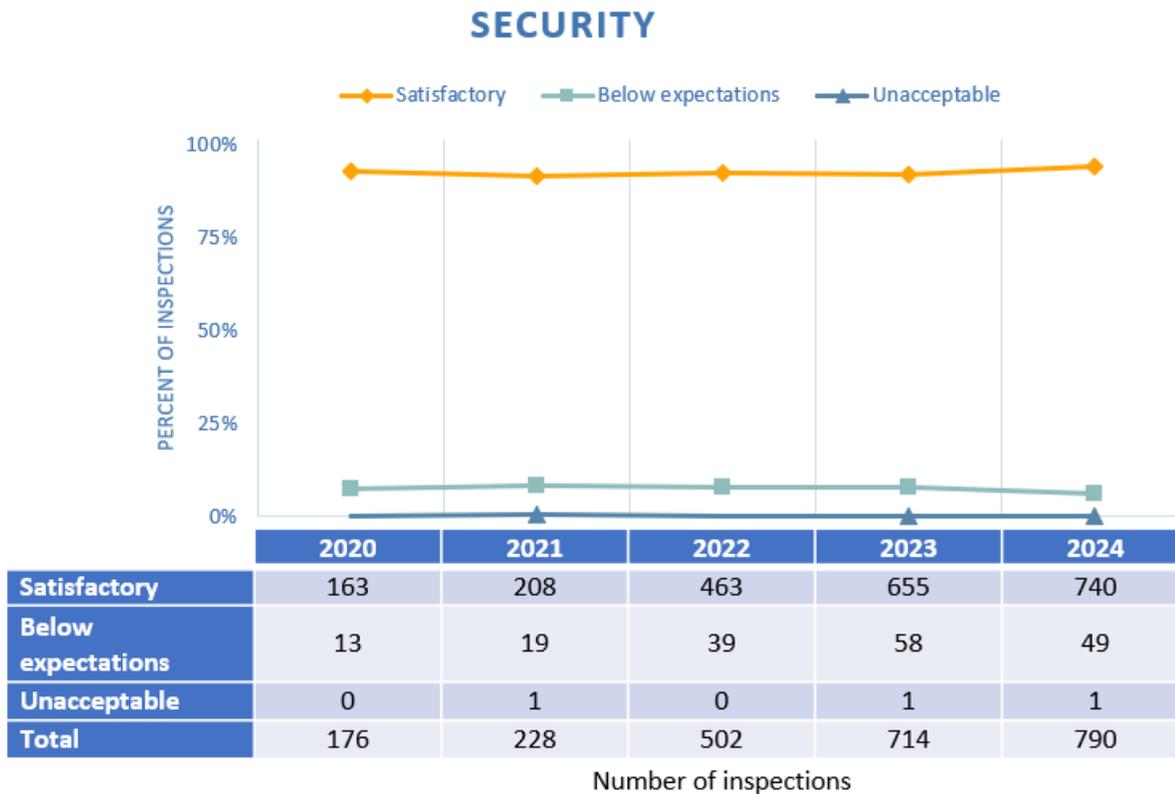


Figure 14: Sector-by-sector comparison of satisfactory inspection ratings for the security SCA, 2020 to 2024

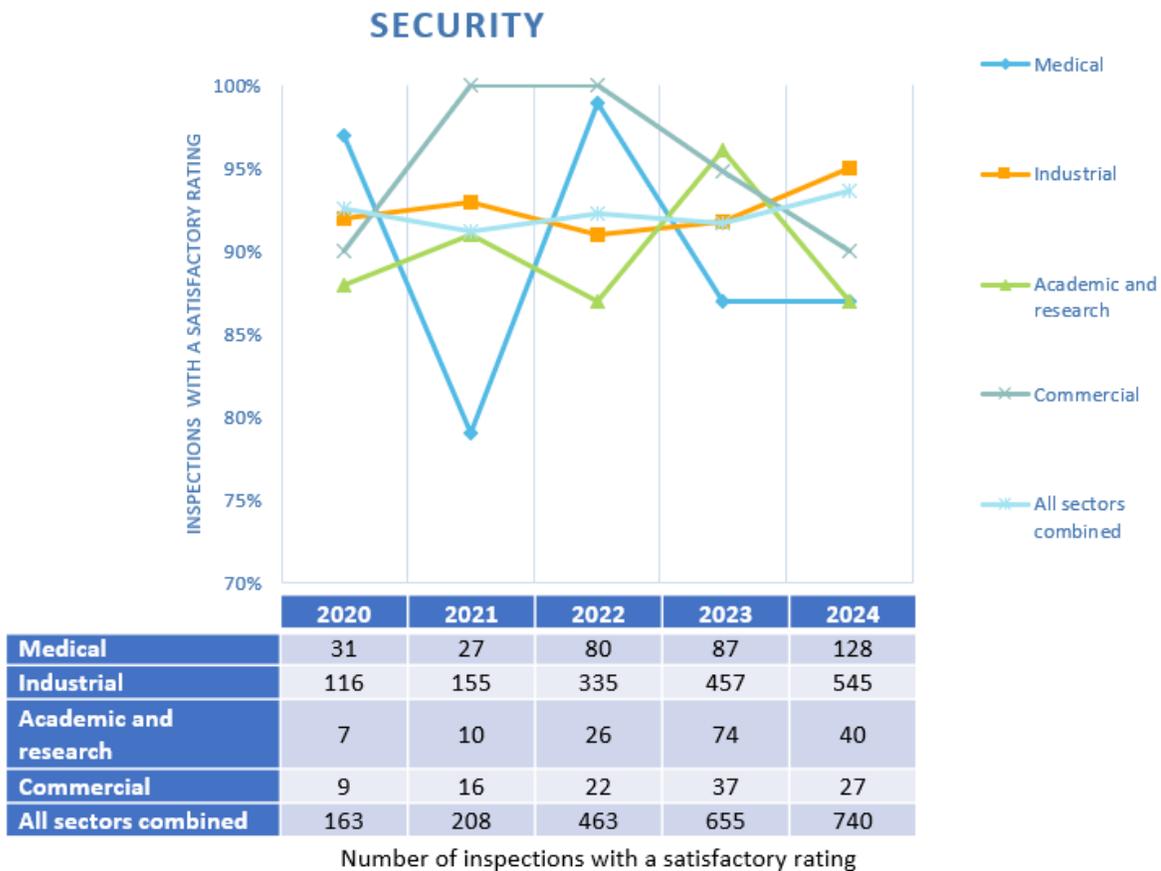
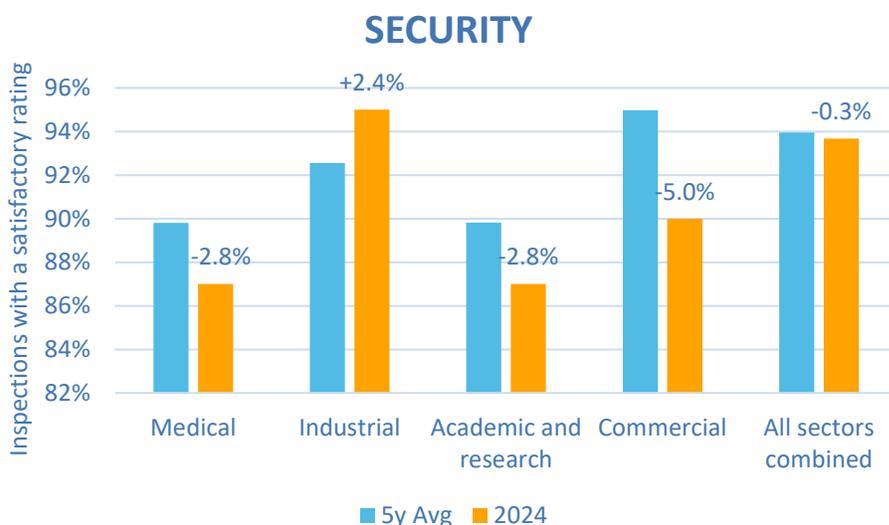


Figure 15: Sector-by-sector comparison of satisfactory inspection ratings for the security SCA, 2024 versus the 5-year average (2020 to 2024)



F5: Environmental protection and conventional health and safety

The environmental protection and conventional health and safety SCAs are only reported on in this report for the WNSL. Over the last 5 years, all WNSL have consistently received satisfactory ratings in both of these SCAs.

Table 6: Percentage of waste nuclear substance licensees with satisfactory ratings in the environmental protection and conventional health and safety SCAs, 2020 to 2024

SCA	2020	2021	2022	2023	2024
Environmental protection	100%	100%	100%	100%	100%
Conventional health and safety	100%	100%	100%	100%	100%

Appendix G: 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 5](#) 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.

G1: Medical sector

Tables 7 to 10 show the inspection performance of licensees in the medical sector. Subsector performance for the years 2020 to 2024 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 7: Management system – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the medical sector and selected subsectors, 2020 to 2024

SCA	Subsector / sector	2020	2021	2022	2023	2024
Management system	Nuclear medicine	94% (47)	99% (89)	97% (76)	99% (75)	98% (115)
Management system	Radiation therapy	0% (1)	70% (10)	100% (9)	67% (3)	80% (5)
Management system	Veterinary nuclear medicine	(0)	100% (3)	100% (7)	100% (5)	100% (2)
Management system	Entire medical sector	92% (48)	96% (105)	98% (95)	98% (89)	98% (132)

Table 8: Operating performance – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the medical sector and selected subsectors, 2020 to 2024

SCA	Subsector / sector	2020	2021	2022	2023	2024
Operating performance	Nuclear medicine	77% (48)	83% (89)	84% (76)	81% (75)	87% (115)
Operating performance	Radiation therapy	100% (2)	90% (10)	100% (15)	50% (4)	83% (12)
Operating performance	Veterinary nuclear medicine	100% (1)	100% (3)	75% (8)	100% (6)	100% (2)
Operating performance	Entire medical sector	77% (51)	84% (115)	85% (103)	82% (91)	88% (139)

Table 9: Radiation protection – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the medical sector and selected subsectors, 2020 to 2024

SCA	Subsector / sector	2020	2021	2022	2023	2024
Radiation protection	Nuclear medicine	73% (48)	75% (119)	63% (91)	54% (89)	51% (132)
Radiation protection	Radiation therapy	100% (2)	100% (20)	93% (15)	100% (4)	92% (12)
Radiation protection	Veterinary nuclear medicine	100% (1)	33% (3)	63% (8)	67% (6)	0% (2)
Radiation protection	Entire medical sector	76% (51)	78% (145)	68% (118)	59% (105)	56% (156)

The nuclear medicine subsector demonstrated lower performance in the radiation protection SCA once again in comparison to previous years, although ratings have been consistently low over the last 5 years. The most frequent items of non-compliance in 2024 were related to the ascertainment and recording of doses (specifically related for extremity dosimetry) and those related to radiation detection equipment. 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. Staff will be prioritizing nuclear medicine inspections over other medium risk

inspections in 2025. As mentioned in section 4.2, the methodology for rating this SCA is being revised to better reflect the actual risk.

Table 10: Security – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the medical sector, 2020 to 2024

SCA	Sector	2020	2021	2022	2023	2024
Security	Medical sector	97% (33)	79% (34)	99% (81)	87% (100)	93% (137)

G2: Industrial sector

Tables 11 to 14 show the inspection performance of licensees in the industrial sector. Subsector performance for the years 2020 to 2024 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 11: Management system – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the industrial sector and selected subsectors, 2020 to 2024

SCA	Subsector / sector	2020	2021	2022	2023	2024
Management system	Portable gauge	98% (92)	96% (171)	98% (207)	99% (249)	98% (282)
Management system	Fixed gauge	94% (94)	98% (64)	98% (91)	96% (139)	99% (157)
Management system	Industrial radiography	98% (66)	99% (82)	98% (108)	97% (98)	96% (120)
Management system	Oil-well logging	89% (9)	93% (15)	100% (23)	90% (21)	100% (26)

SCA	Subsector / sector	2020	2021	2022	2023	2024
Management system	Entire industrial sector	96% (261)	97% (340)	98% (437)	97% (511)	98% (594)

Table 12: Operating performance – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the industrial sector and selected subsectors, 2020 to 2024

SCA	Subsector / sector	2020	2021	2022	2023	2024
Operating performance	Portable gauge	89% (192)	82% (210)	82% (210)	84% (259)	87% (285)
Operating performance	Fixed gauge	72% (64)	67% (91)	67% (91)	74% (140)	76% (158)
Operating performance	Industrial radiography	95% (82)	95% (107)	95% (107)	93% (98)	99% (120)
Operating performance	Oil-well logging	100% (14)	88% (24)	88% (24)	90% (21)	89% (26)
Operating performance	Entire industrial sector	88% (363)	83% (444)	83% (444)	83% (524)	87% (601)

The fixed gauge subsector has demonstrated 2 consecutive years of improved performance after a period of declining performance. Most non-compliances in this subsector continue to be related to licensees not performing or recording activities committed to in their radiation safety manuals including internal audits, leak testing and shutter verification checks. Staff continue to prioritize inspections for medium-risk licensees, such as those in the fixed gauge subsector, with the current focus on those licensees that are overdue for an inspection as well as licensees with the vessel entry licence condition. Staff are satisfied with this prioritization, as most non-compliances are administrative in nature.

Table 13: Radiation protection – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the industrial sector and selected subsectors, 2020 to 2024

SCA	Subsector / sector	2020	2021	2022	2023	2024
Radiation protection	Portable gauge	83% (98)	81% (192)	71% (210)	75% (261)	80% (285)
Radiation protection	Fixed gauge	82% (94)	80% (64)	74% (91)	77% (140)	74% (157)
Radiation protection	Industrial radiography	86% (66)	93% (82)	89% (108)	90% (98)	91% (120)
Radiation protection	Oil-well logging	89% (9)	93% (14)	87% (23)	81% (21)	92% (26)
Radiation protection	Entire industrial sector	84% (267)	85% (364)	77% (444)	79% (526)	81% (600)

Performance remained relatively stable across the sector with most subsectors showing some improvement. The most frequent non-compliances in 2024 were related to the lack of oversight of the radiation protection program and survey meter availability and calibration. 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 14: Security – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the industrial sector, 2020 to 2024

SCA	Sector	2020	2021	2022	2023	2024
Security	Industrial sector	92% (122)	93% (167)	91% (369)	92% (498)	95% (577)

G3: Academic and research sector

Tables 15 to 18 show the inspection performance of licensees in the academic and research sector. Subsector performance for the years 2020 to 2024 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 15: Management system – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the academic and research sector and 1 selected subsector, 2020 to 2024

SCA	Subsector / sector	2020	2021	2022	2023	2024
Management system	Laboratory studies and consolidated use	100% (9)	100% (16)	97% (32)	93% (75)	98% (44)
Management system	Entire academic and research sector	100% (9)	100% (18)	97% (34)	96% (77)	98% (44)

Table 16: Operating performance – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the academic and research sector and 1 selected subsector, 2020 to 2024

SCA	Subsector / sector	2020	2021	2022	2023	2024
Operating performance	Laboratory studies and consolidated use	89% (9)	94% (16)	100% (32)	91% (74)	98% (44)
Operating performance	Entire academic and research sector	90% (10)	96% (23)	97% (36)	91% (78)	96% (46)

Table 17: Radiation protection – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the academic and research sector and 1 selected subsector, 2020 to 2024

SCA	Subsector / sector	2020	2021	2022	2023	2024
Radiation protection	Laboratory studies and consolidated use	100% (10)	69% (16)	84% (32)	88% (75)	89% (44)

SCA	Subsector / sector	2020	2021	2022	2023	2024
Radiation protection	Entire academic and research sector	100% (10)	78% (23)	83% (35)	87% (79)	85% (46)

Table 18: Security – Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the academic and research sector, 2020 to 2024

SCA	Sector	2020	2021	2022	2023	2024
Security	Academic and research sector	100% (7)	91% (11)	87% (30)	96% (77)	87% (46)

G4: Commercial sector

Table 19 shows the inspection performance of licensees in the commercial sector. The performance of the sector for the years 2020 to 2024 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 19: Percentage of inspections with satisfactory ratings (and number of inspections conducted) for the commercial sector, 2020 to 2024

SCA	2020	2021	2022	2023	2024
Management system	100% (14)	92% (26)	94% (31)	96% (50)	87% (37)
Operating performance	94% (18)	87% (30)	91% (33)	89% (53)	91% (42)

Radiation protection	100% (21)	90% (29)	91% (33)	79% (53)	83% (40)
Security	90% (10)	100% (16)	100% (22)	95% (39)	90% (30)

There appears to have been a drop in performance in the management system SCA in this sector as a whole. Although there were 5 inspections that resulted in below expectation ratings, these were divided among 3 different subsectors. As mentioned above, it is difficult to determine if these findings are indicative of a trend due to the low number of licensees in some subsectors and due to the low number of inspections and findings in some of the subsectors.

Appendix H: Enforcement actions issued in 2024

In 2024, CNSC staff issued 9 orders and 4 administrative monetary penalties (AMPs) to licensees. Additionally, a request was made under subsection 12(2) of the [General Nuclear Safety and Control Regulations \(GNSCR\)](#). The majority, 8 orders and 3 AMPs, were issued to licensees in the industrial sector, which is consistent with trends in previous years. One order was issued to a licensee in the medical sector, 1 AMP was issued to an individual working in the medical sector and the request made under the GNSCR was made to a licensee in the medical sector.

A complete list of orders and AMPs issued is included in tables 20 and 21 respectively. All AMPs have been paid and 8 of the 9 orders issued have been closed. The CNSC is satisfied that licensees in general respond appropriately to enforcement actions.

Additional information is available in [section 6](#) of this report.

Figure 16: Sector-by-sector comparison of enforcement actions issued, 2020 to 2024

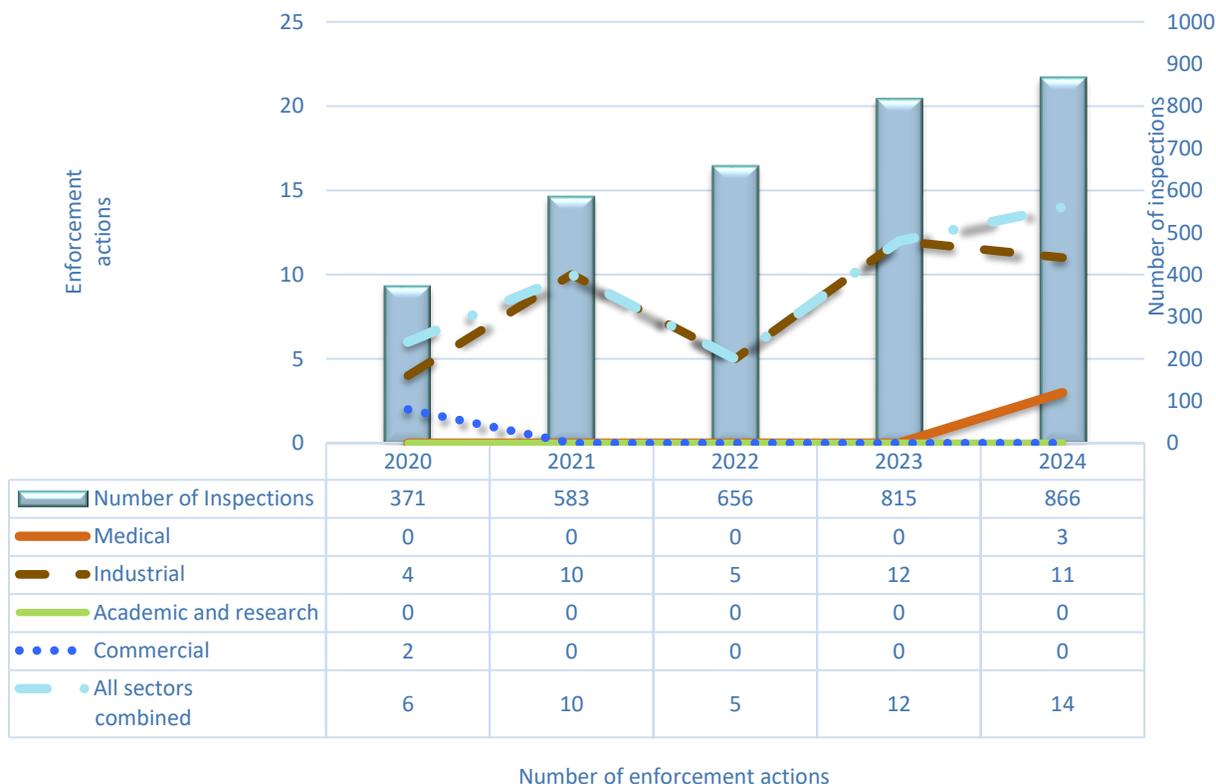


Table 20: Orders issued in 2024

Date of issue	Order #	Location	Licensee	Subsector / sector	Order summary	Licensee response	Status
2024-05-07	1275	9600 Bathurst Street, Suite 302 Vaughan ON L6A 3Z8	1908273 Ontario Ltd.	Diagnostic and therapeutic nuclear medicine / medical	<p>The order was issued following an inspection at the licensee's location in Vaughan. The order required the licensee to keep all sealed radioactive sources currently in its possession in secure storage and prohibited the licensee from using, transferring, importing or exporting radioactive materials until it had demonstrated, to the CNSC's satisfaction, adequate management oversight of its radiation protection program.</p> <p>An additional order was issued in January 2025 following new information that the licensee is no longer operational which required the licensee to fully decommission the licensed location. This order has been closed, and the licensee no longer has any locations in which they operate. The original order (1275) remains open to ensure the licensee does not restart operations without implementing corrective measures to its radiation protection program. It will remain in effect until the licensee corrects their program, or until the licence is revoked or expires.</p>	Pursuant to section 25 of the NSCA, the Commission revoked the licence issued to the company leading to the closure of the order.	Closed

Date of issue	Order #	Location	Licensee	Subsector / sector	Order summary	Licensee response	Status
2024-05-30	1264	1533 Highway 11 West, Hearst, ON POL 1N0	C.Villeneuve Construction Co.Ltd.	Portable gauge / industrial	The order was issued during a field inspection at a construction site on the Trans-Canada Highway, east of the town limits of Kapuskasing, Ontario. The order prohibited a worker from using the portable gauges listed on the licence until the licensee demonstrated, to the CNSC's satisfaction, that this worker had received appropriate training.	The licensee has complied with the terms of the order to the satisfaction of the CNSC.	Closed on 2024-06-27
2024-07-22	494	4, 120 Glacier Street, Coquitlam, BC V3K 5Z6	Accurate Materials Testing Ltd.	Portable gauge / industrial	The order was issued during a routine inspection in Coquitlam. The order prohibited the licensee from using its portable nuclear gauges listed on the licence until the licensee demonstrated, to the CNSC's satisfaction, that the radiation safety program had been effectively implemented, and that all notices of non-compliance had been corrected.	The licensee has complied with the terms of the order to the satisfaction of the CNSC.	Closed on 2024-12-20
2024-08-15	1010	401-6741 Cariboo Road, Burnaby, BC V3N 4A3	Metro Testing & Engineering Ltd	Portable gauge / industrial	The order was issued during an unannounced field inspection in Burnaby, BC. The order prohibited a worker from using the portable nuclear gauges listed on the licence until the licensee demonstrated, to the CNSC's satisfaction, that this worker had been properly trained and could work safely and securely.	The licensee has complied with the terms of the order to the satisfaction of the CNSC.	Closed on 2024-09-10
2024-09-16	1167	796, 4 th Avenue,	Civil North Consulting Ltd.	Portable gauge / industrial	The order, which was issued during a routine inspection in Prince George, British	The licensee has begun implementing	open

Date of issue	Order #	Location	Licensee	Subsector / sector	Order summary	Licensee response	Status
		Prince George, BC, V2L 3H3			Columbia, required the licensee to cease all use and transport of radiation devices and to immediately place all gauges into secure storage. This order will remain in effect until the licensee demonstrates to CNSC staff that it has implemented an effective radiation protection program and that it has corrected all items of non-compliance identified in the preliminary inspection report.	corrective measures to address non-compliances but has not yet addressed all items to the CNSC's satisfaction.	
2024-09-17	1166	1725 Theodore Road, Prince George, BC, V2K 5W6	Enviro-Ex Contracting Ltd.	Portable gauge / industrial	The order, which was issued during an unannounced field inspection in Prince George, British Columbia, required the licensee to immediately place all gauges into secure storage. This order remained in effect until the licensee demonstrated to the CNSC that it could ensure compliance with the <i>Packaging and Transport of Nuclear Substances Regulations 2015</i> and the <i>Transportation of Dangerous Goods Regulations</i> .	The licensee has complied with the terms of the order to the satisfaction of the CNSC.	Closed on 2024-10-11
2024-10-23	1093	5945 Tillicum Bay Road, Sechelt, BC, V0N 3A4	Sunshine Coast Materials Testing Ltd.	Portable gauge / industrial	The order, which was issued during a routine inspection in Sechelt British Columbia, required the licensee to immediately place all gauges into secure storage. This order remained in effect until the licensee had demonstrated to the CNSC that it had implemented an effective radiation protection program and that it	The licensee has complied with the terms of the order to the satisfaction of the CNSC.	Closed on 2024-12-23

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Date of issue	Order #	Location	Licensee	Subsector / sector	Order summary	Licensee response	Status
					had corrected all items of non-compliance identified in the preliminary inspection report. Sunshine Coast Materials Testing Ltd. was also not permitted to transport portable gauges until it had demonstrated full compliance with the <i>Packaging and Transport of Nuclear Substances Regulations, 2015</i> and the <i>Transportation of Dangerous Goods Regulations</i> .		
2024-12-11	495	1229, 13 Avenue Southwest, Calgary, AB, T3C 0T2	Vision Integrity Engineering Ltd.	Industrial radiography / industrial	The order, which was issued during a routine inspection in Medicine Hat Alberta, prohibited 3 workers from performing radiography operations. It also ordered the return of 3 exposure devices from work sites undisclosed to the CNSC and the placement of those devices into secure storage at a CNSC-approved location. This order remained in effect until the licensee demonstrated to the CNSC that it had implemented an effective radiation protection program at the indicated locations and for any subcontracted work.	The licensee has complied with the terms of the order to the satisfaction of the CNSC.	Closed on 2025-01-09
2024-12-12	1306	3910-181 Bay Street, Toronto, ON, M5J 2T3	Prodigy Gold Inc	Fixed gauge / industrial	The order was issued after the licensee did not attend a remote compliance inspection of the licensed location in Dubreuilville, Ontario. The order required the licensee to cease using all radiation devices at its licensed location until it had demonstrated to the CNSC's satisfaction that there was an	The licensee has complied with the terms of the order to the satisfaction of the CNSC.	Closed on 2025-01-20

Date of issue	Order #	Location	Licensee	Subsector / sector	Order summary	Licensee response	Status
					acceptable level of management oversight for the radiation protection program.		

Table 21: Administrative monetary penalties issued in 2024

Date of issue	AMP	Licensee	Subsector / sector	Amount	AMP description	Closed
2024-02-02	2024-AMP-01	Individual	Nuclear medicine / medical	\$10,000	<p>The individual falsified records, in contravention of Paragraph 48(i) of the <i>Nuclear Safety and Control Act</i>. Specifically, the individual falsified written records related to thyroid screening. The individual received the maximum penalty amount that can be issued to an individual for this type of violation, considering the violation occurred on at least 33 separate occasions.</p> <p>An event initial report related to this contravention was presented to the Commission and a further update provided at another Commission proceeding.</p>	Paid on 2024-03-01
2024-06-18	2024-AMP-03	Thompson Creek Metals Company Inc.	Fixed gauge / industrial	\$1,000	<p>The licensee failed to comply with a condition of a licence in violation of paragraph 48(c) of the <i>Nuclear Safety and Control Act</i>.</p> <p>The AMP was issued following an event reported by the licensee in which 2 workers entered a vessel equipped with a fixed nuclear gauge without properly ensuring that the gauge had been made safe.</p>	Paid on 2024-06-26

Date of issue	AMP	Licensee	Subsector / sector	Amount	AMP description	Closed
2024-06-25	2024-AMP-04	JLP Services Inc.	Portable gauge / industrial	\$3,730	<p>The licensee was in possession of a container or device containing a nuclear substance without proper labelling in violation of subsection 20(1) of the <i>Radiation Protection Regulations</i>.</p> <p>The AMP was issued because of repeated non-compliance and ineffective implementation of corrective measures related to improper labelling of the licensee's portable nuclear gauges.</p>	Paid on 2024-07-02
2024-08-30	2024-AMP-05	Construction DJL Inc./DJL Construction Inc.	Portable gauge / industrial	\$9,190	<p>The licensee failed to use a licensed dosimetry service to measure and monitor doses of radiation received by their nuclear energy workers in violation of subsection 8(1) of the <i>Radiation Protection Regulations</i>.</p> <p>The CNSC conducted a follow-up inspection, which identified that the licensee did not implement the required corrective measures following a previous inspection.</p> <p>The follow-up inspection also revealed that the licensee had failed to provide a dosimeter to several workers in accordance with its internal procedures and had failed to meet its commitment to communicate annual dose to its workers.</p>	Paid on 2024-09-11

Appendix I: Effective doses to workers

Occupational effective doses were reported by licensees for a total of 52,172 workers in the 4 sectors in 2024. Of those workers, 22,330 were nuclear energy workers (NEWs). The difference in effective doses to workers among sectors reflects the nature of the various activities within those sectors. Figure 17 shows the effective doses received by non-NEWs reported in 2024, with 91% reported as having received doses less than or equal to 0.5 mSv. Figure 18 shows the effective doses received by NEWs reported in 2024. Based on the reported doses for NEWs, only about 18% received a dose greater than 1 mSv, 89% received a dose of less than or equal to 2 mSv and less than 1.4% received a dose above 5 mSv.

To further increase the granularity of dose reporting, CNSC staff have updated the annual compliance report forms to subdivide the 1–5 mSv effective dose category into 1–2 mSv and 2–5 mSv categories. In the past, we have included a graph showing the annual effective doses to NEWs, over 5 years, but due to this change, we no longer have 5 years of data to compare. This year, staff have 2 years to compare, and new data will be added to the graphs each year moving forward until we again have a rolling 5-year average. For completeness, staff have included Table 22 which includes both historical and current dose categories, covering the years from 2020-2022. Note that when the category was not in use in a particular year, not applicable (N.A.) is included in the table.

Table 22: Annual effective doses to NEWs, 2020 to 2024, all sectors combined (incorporating historical and current dose collecting categories)

Dose category	≤ 0.5 mSv	>0.5 mSv and ≤ 1mSv	>1 mSv and ≤ 2 mSv	>1 mSv and ≤ 5 mSv	>2 mSv and ≤ 5 mSv	> 5 mSv and ≤ 20 mSv	> 20 mSv	> 20 mSv and ≤ 50 mSv	> 50 mSv
2020	16,051	2,817	N.A.	3,600	N.A.	409	N.A.	1	0
2021	17,301	3,306	N.A.	3,163	N.A.	295	N.A.	1	0
2022	12,837	3,063	N.A.	3,614	N.A.	298	N.A.	0	0
2023	15,882	1,815	1,604	N.A.	2,291	325	0	N.A.	N.A.
2024	14,999	3,303	1,537	N.A.	2,189	301	1	N.A.	N.A.

As the figures demonstrate, effective doses overall are low. Previous year-over-year trending showed this was consistent across 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 consistency year over year indicated that effective doses have likely achieved a state of equilibrium – changes in operational procedures will likely not yield any significant improvements. When this comparison is re-introduced in future reports, with the new reporting categories, it is anticipated that this state of equilibrium will once again be demonstrated.

More information on effective doses is provided in [section 7](#) of this report.

Figure 17: Sector-by-sector comparison of annual effective doses to all non-NEWs reported by licensees in 2024

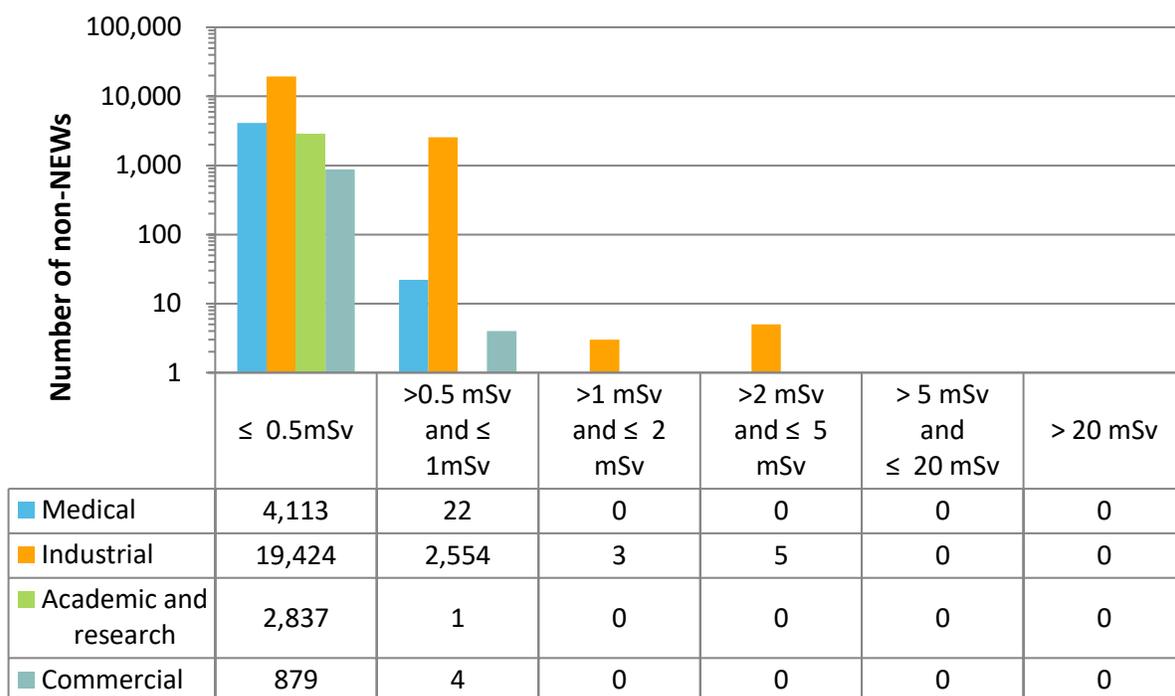
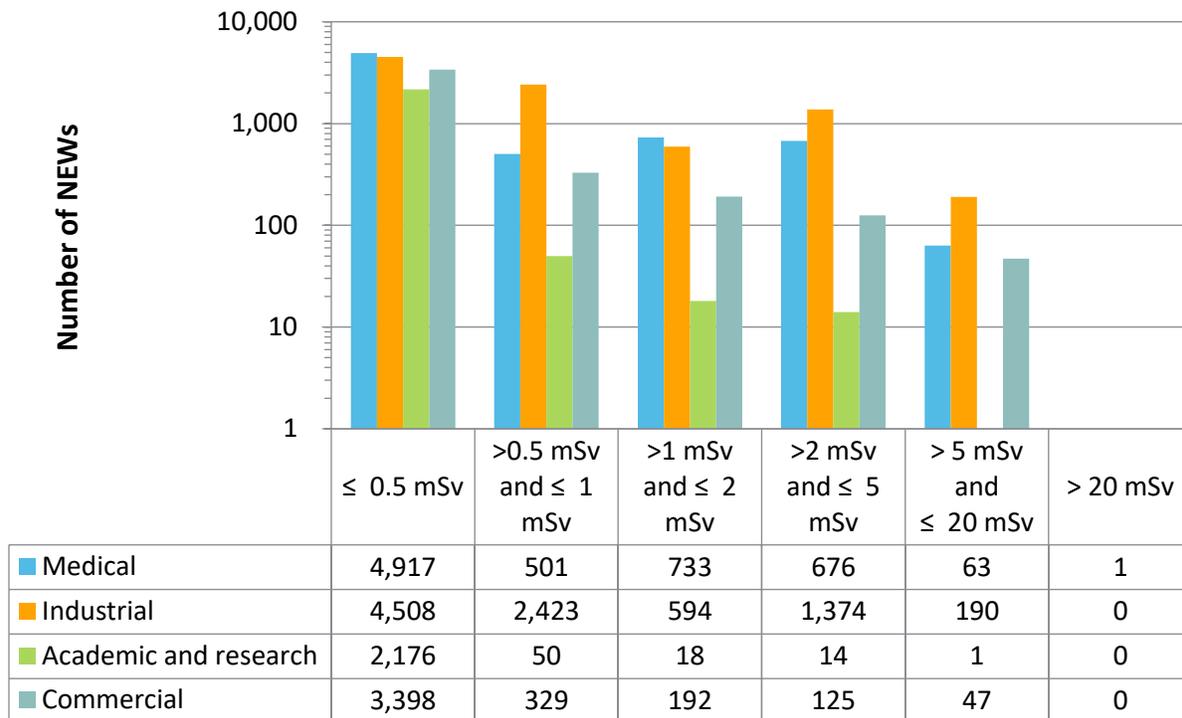


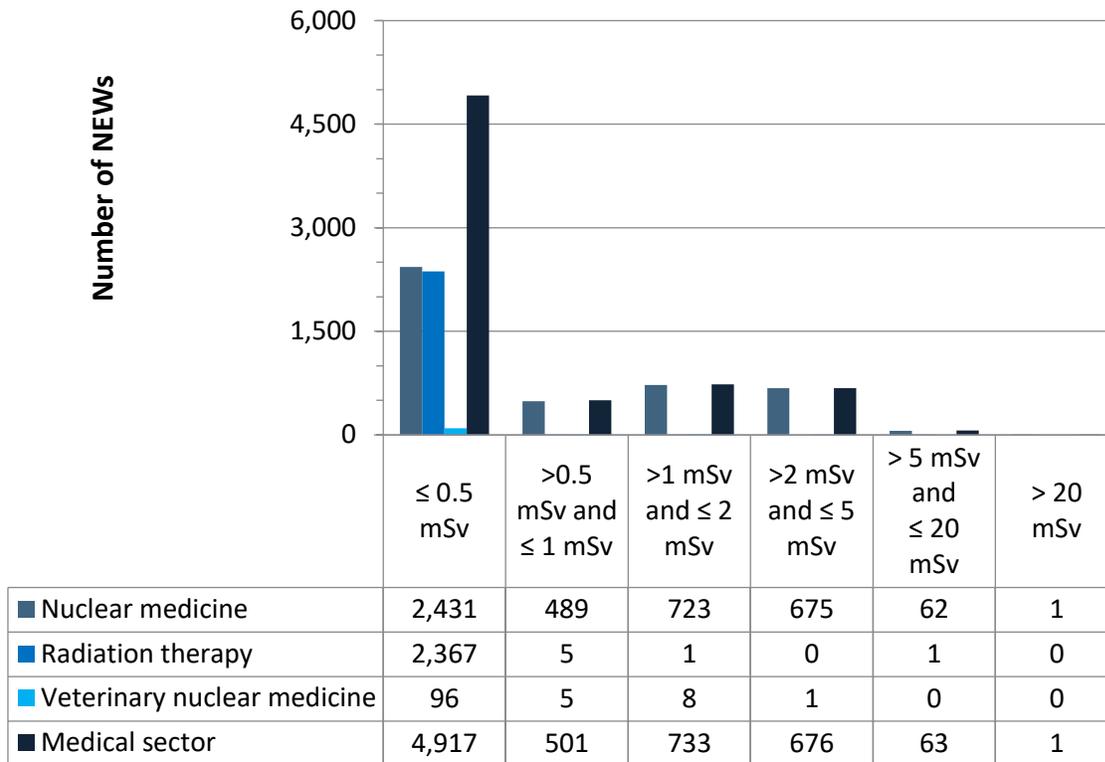
Figure 18: Sector-by-sector comparison of annual effective doses to all NEWs reported by licensees in 2024



I1: Medical sector

Figure 19 shows the effective doses received by NEWs in the medical sector, as reported to the CNSC for 2024. Note that the total number of NEWs shown in the “Medical sector” row is the aggregate for the entire sector, including subsectors not highlighted.

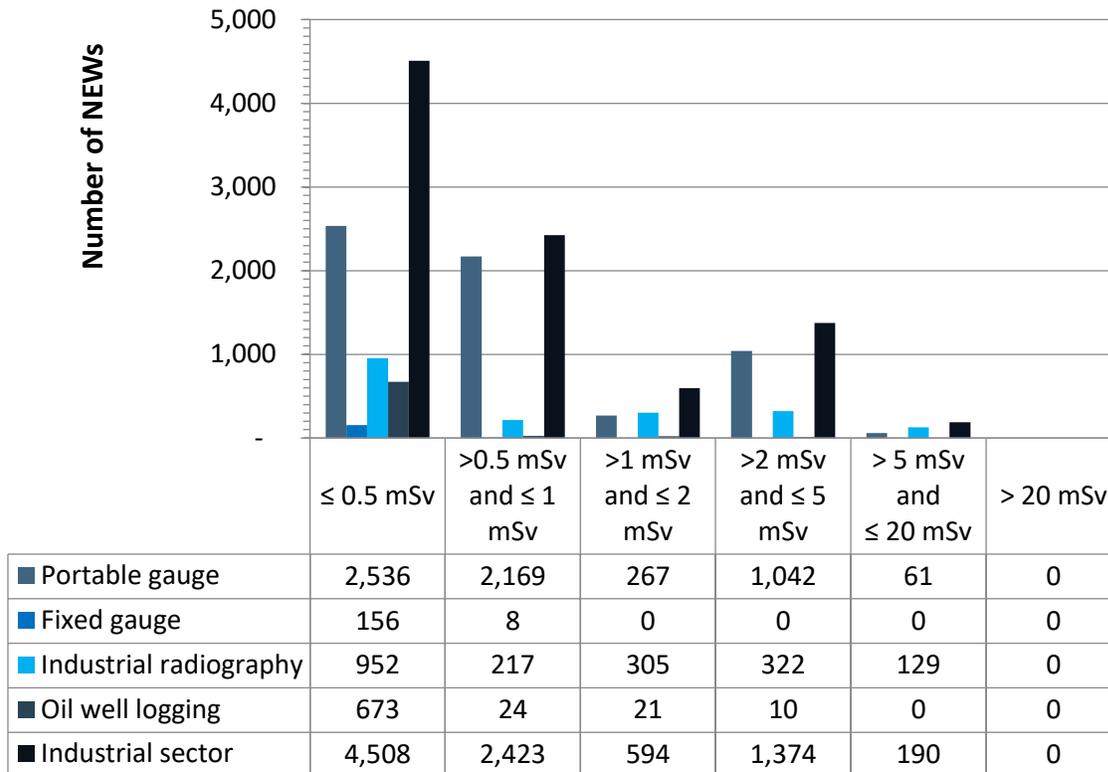
Figure 19: Reported effective doses to NEWs in the medical sector (selected subsectors and entire sector), 2024



I2: Industrial sector

Figure 20 shows the effective doses received by NEWs in the industrial sector, as reported to the CNSC for 2024. Note that the total number of NEWs shown in the “Industrial sector” row is the aggregate for the entire sector, including subsectors not highlighted.

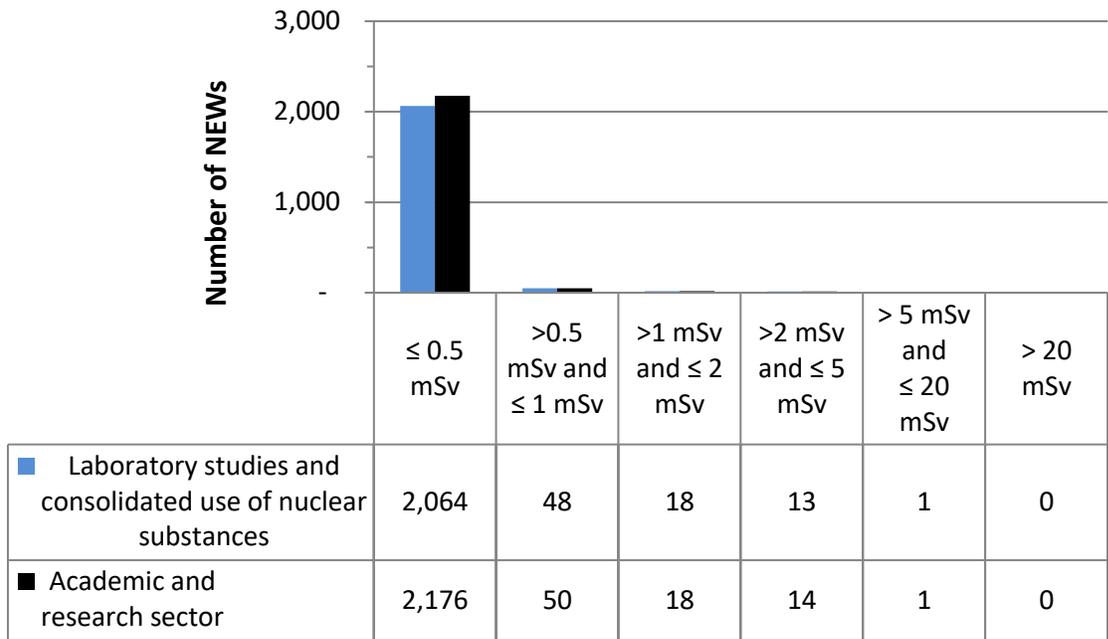
Figure 20: Reported effective doses to NEWs in the industrial sector (selected subsectors and entire sector), 2024



I3: Academic and research sector

Figure 21 shows the effective doses received by NEWs in the academic and research sector, as reported to the CNSC for 2024. 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.

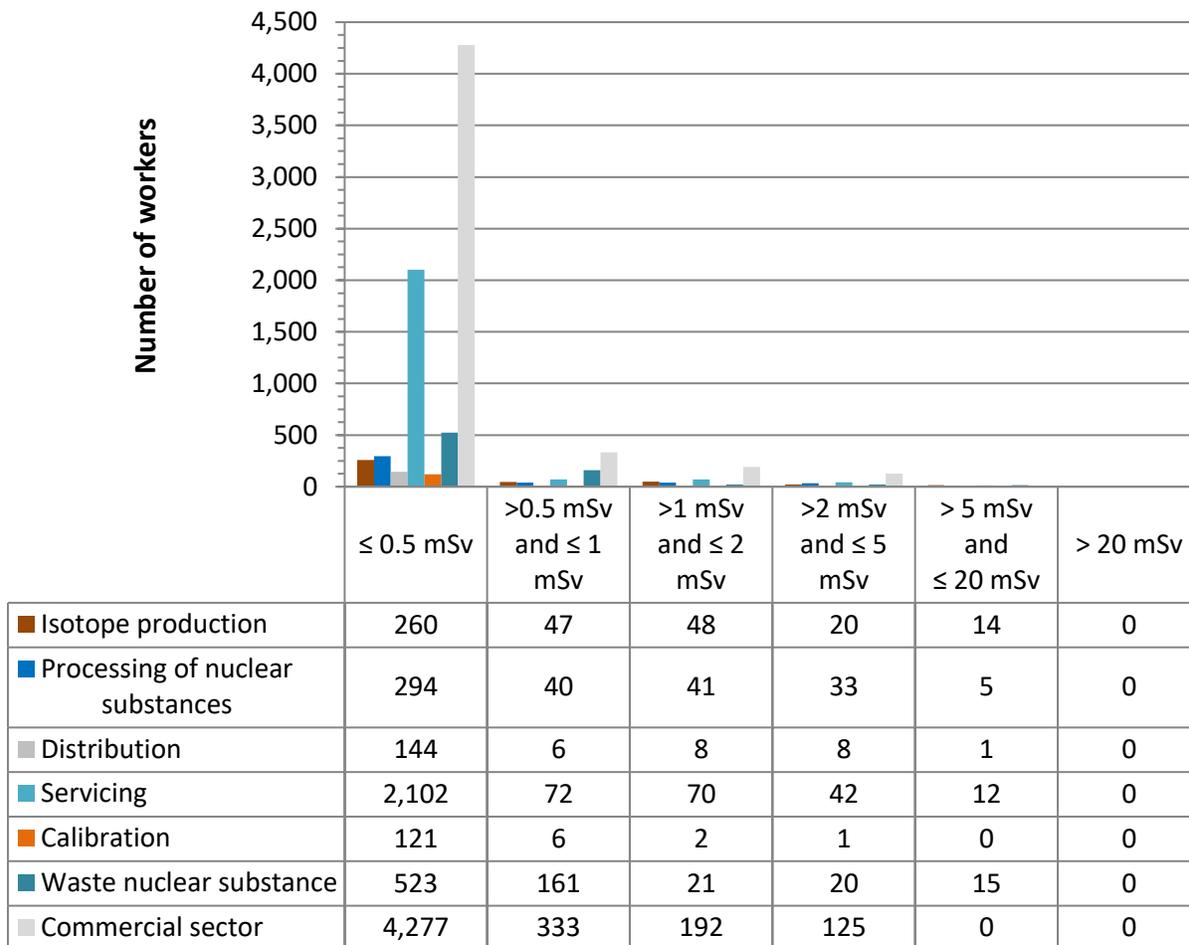
Figure 21: Reported effective doses to NEWs in the academic and research sector (selected subsector and entire sector), 2024



I4: Commercial sector

Figure 22 shows the effective doses received by NEWs in the commercial sector, as reported to the CNSC for 2024. Note that the total number of NEWs shown in the “Commercial sector” row is the aggregate for the entire sector, including subsectors not highlighted.

Figure 22: Reported effective doses to NEWs in the commercial sector (selected subsectors and entire sector), 2024



Appendix J: Reportable events

In 2024, staff were notified of 194 reportable events. Staff also received many notifications not considered reportable events including such things as action level exceedances, successful fishing operations (well-logging), bankruptcy and potential work disruptions. Of the 194 reportable events, 188 were rated as level 0 (no safety significance) on the International Nuclear and Radiological Event Scale (INES) and 6 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 23 shows the 5-year trend for different types of events, tables 23 to 27 show event data by sector and subsector for each type of reportable event, and table 28 provides a summary of all reportable events. Additional information on reportable events is provided in [section 8](#).

Figure 23: Reportable events from 2020 to 2024, all sectors combined

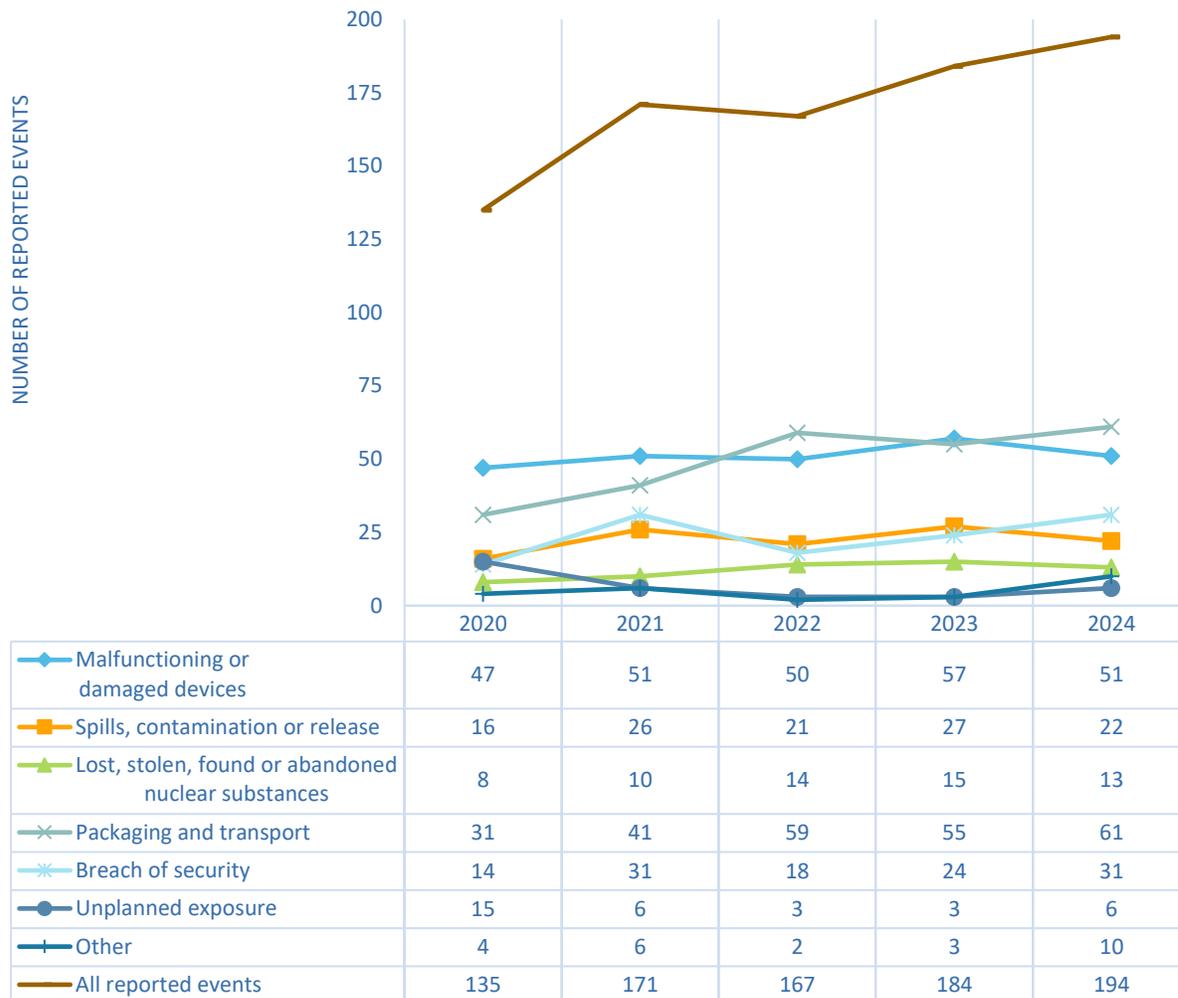


Table 23: Commercial sector reportable events in 2024

There was a total of 42 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	2	8	0	1	0	0	0
Processing of nuclear substances	0	0	0	19	0	0	0
Distribution	0	0	0	3	1	0	0
Servicing	1	0	0	0	0	0	0
Calibration	1	0	0	0	0	0	0
Waste nuclear substance	0	0	0	2	1	0	3
Other	0	0	0	0	0	0	0

Table 24: Medical sector reportable events in 2024

There was a total of 57 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	14	4	5	2	1	2
Radiation therapy	6	0	3	0	18	0	1
Veterinary nuclear medicine	0	0	0	0	0	0	0
Other	0	0	0	0	1	0	0

Table 25: Industrial sector reportable events in 2024

There was a total of 87 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	18	0	3	26	3	1	0
Fixed gauge	16	0	0	0	1	0	2
Industrial radiography	7	0	0	4	0	4	0
Oil-well logging	0	0	0	1	1	0	0
Other	0	0	0	0	0	0	0

Table 26: Academic and research sector reportable events in 2024

There was a total of 8 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	0	2	0	1	0	2
Other	0	0	1	0	2	0	0

Table 27: Reportable events in all sectors in 2024

There was a total of 194 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	51	22	13	61	31	6	10

Table 28: Reportable events in 2024

Event ID	Date reported	INES rating	Event type	Sector	Subsector	Edited Summary
6148	2024-01-03	0	Device malfunction	Commercial	Servicing	A licensed service provider reported that they had received a portable gauge for servicing with the shutter stuck in the open position. The owner of the gauge reminded staff of their procedure for confirming if a shutter is opened or closed and in addition posted signage in the gauge storage area on this topic. The service provider cleaned the gauge and closed the shutter. There were no overexposures because of this event.
6149	2024-01-05	0	Transport issue	Medical	Diagnostic and therapeutic nuclear medicine	A licensee reported at a package containing a Mo-99/Tc-99m generator was damaged upon receipt. There was no damage to the contents.
6163	2024-01-09	0	Breach of security	Medical	Radiation therapy	A high dose rate (HDR) brachytherapy room was left unsecured when there was no authorized user present. All nuclear substances were accounted for. This was a repeated event for this licensee and a revised site security plan was submitted and approved.
6171	2024-01-15	0	Breach of security	Medical	Radiation therapy	A motion sensor in a radiation therapy room was found unarmed during a regular security patrol when there was no authorized user present. The security guard armed the motion sensor and the RSO was informed. The licensee implemented actions to prevent a recurrence.
6168	2024-01-16	0	Transport issue	Commercial	Distribution	A carrier notified the CNSC of a wet, damaged package on the tarmac at the Montreal airport. The consignor confirmed that the inner containment was not

						compromised, and the package continued to its destination.
6172	2024-01-17	0	Device malfunction	Medical	Radiation therapy	While commissioning a new accelerator, the licensee discovered that the last person out (LPO) circuit and an audible alarm meant to deter a person from entering the maze were not functioning properly. Other safety measures were in place until such a time that the equipment was fixed.
6173	2024-01-23	0	Breach of security	Medical	Radiation therapy	The licensee discovered that the chain securing the HDR unit to the wall was found unlocked. After investigation, a new lock was installed.
6176	2024-01-29	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that one of their vehicles, carrying a portable gauge, was involved in a motor vehicle collision (MVC) with a deer. The portable gauge was undamaged and there was no injury to the driver.
6178	2024-01-30	0	Device damaged	Industrial	Industrial radiography	The licensee reported that an exposure device was damaged when it fell 18 feet from the rope used to raise it after the worker responsible failed to verify that the rope was properly secured. The exposure device was tagged out of service and leak tests were performed. No leaks were found, and the device was shipped to a licensed service provider for repair. The licensee reminded the worker that trainees must be supervised at all times and not only during operation of the device.
6180	2024-02-03	0	Device malfunction	Industrial	Fixed gauge	During routine checks, the licensee discovered that shutter on a fixed gauge was stuck in the open position. The gauge was mounted on a pipe in a remote area so there was no risk to workers. A licensed service provider was able to repair the shutter. The licensee will continue performing regular checks of all fixed gauges.

6183	2024-02-05	0	Transport issue	Commercial	Processing of nuclear substances	The licensee reported that a properly labelled Type A package containing medical isotopes was transported without a proper shipping document. The licensee was meant to be picking up empty cases from another licensee for return but one of the cases still contained a unit dose of F-18. The employee in question received refresher training to remind them to check the contents of the package prior to taking empty cases. There were no overexposures because of this event.
WNSL-1	2024-02-07	0	Other	Commercial	Waste nuclear substances	The licensee reported a false fire alarm because of demolition work producing airborne dust. There was a delay in security notifying the fire department regarding this fire alarm. The licensee committed to investigating transitioning to a third-party Operational Dispatch System for notifying emergency services. All security guards performed self-study of the site's emergency response procedure to ensure they understood their role and all smoke detectors to be bagged while demolitions are occurring. In addition, a focused fire alarm drill was to be scheduled after hours to practice the response to a fire alarm.
6190	2024-02-09	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that a shutter on a fixed gauge was stuck in the open position. They subsequently found 2 additional gauges with the shutters stuck in the open position. The cause was determined to be related to the harsh operating conditions. A licensed service provider was contacted to repair the shutters. The licensee has modified the frequency of regular maintenance checks to be commensurate with the conditions and is considering installing barriers to further protect the gauges.

6198	2024-02-12	0	Breach of security	Medical	Radiation therapy	A high dose rate (HDR) brachytherapy room was left unsecured when there was no authorized user present. All nuclear substances were accounted for. This was a repeated event for this licensee and a revised site security plan was submitted and approved.
6192	2024-02-13	0	Transport issue	Commercial	Processing of nuclear substances	The licensee notified the CNSC that they had received a damaged package containing I-123. The package was opened, swipes were taken, and no leak was detected.
6193	2024-02-14	1	Stolen	Industrial	Portable gauge	The licensee notified the CNSC that a vehicle with a portable gauge inside was stolen from private property. Four days later, the portable gauge was found on the side of a public road. The licensee has regained possession of the gauge. Although the locks and signage on the transportation case had been removed, there was no damage to the package or the gauge. Refresher training was provided to all technicians on the importance of always maintaining control of their gauges.
6195	2024-02-14	0	Transport-MVC	Industrial	Portable gauge	The licence notified the CNSC that a vehicle transporting a portable gauge was involved in a MVC. Due to poor weather conditions, the pick-up truck rolled over and came to rest upside down in a ditch. Another technician attended the site, and the gauge was recovered with no damage to the package or the gauge. It was sent for leak testing, and no leak was detected.
6194	2024-02-14	0	Other	Academic	Lab studies and consolidated use	The licensee reported that there was an electrical fire one floor above the nuclear medicine department, which triggered the sprinkler system. The fire department responded and confirmed the fire was out, but several nuclear medicine rooms were flooded as a result of the activation of the sprinklers. There were no impacts on the nuclear substances.

6196	2024-02-14	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of greater than 100 exemption quantities (EQ) of F-18. The spill occurred when the syringe slipped out of the technologist's hand due to a problem with the syringe shield. Contamination was limited to the patient's clothing, a chair and the floor. The patient's clothing were kept for decay. There was no skin contamination and no overexposure as a result of this event. Technologists were reminded to replace the screws on syringe shields when the threads are stripped.
6199	2024-02-15	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported a MVC involving a vehicle transporting 14 excepted packages containing trace amounts of Tc-99m. The vehicle struck the median at low speed while avoiding road debris. There was no damage to the packages and minor damage to the vehicle.
6201	2024-02-16	0	Device malfunction	Medical	Radiation therapy	The licensee reported that the door closure interlock for one of their accelerators was malfunctioning. The system was not registering when the door was closed. Due to patients requiring treatment, the license established a plan to safely bypass the interlock system until the system could be repaired. On February 19, the licensee confirmed that the interlock was repaired. This situation is closed with no further actions required.
6202	2024-02-16	0	Breach of security	Industrial	Oil well logging	The licensee reported that part of their storage site security system was malfunctioning. The open/close door sensors were not responding correctly. The licensee contacted the vendor, and the alarm system was repaired.
6204	2024-02-20	0	Breach of security	Medical	Radiation therapy	The licensee reported that a high dose rate (HDR) brachytherapy room was left unsecured when there was no authorized user present. All nuclear substances were accounted for. This was a repeated event for this

						licensee and a revised site security plan was submitted and approved.
6205	2024-02-21	0	Lost	Medical	Radiation therapy	The licensee reported that they had lost an I-125 seed during a pathology protocol. The licensee identified 2 issues with their procedures and corrective actions were put in place. There are no anticipated effects due to this loss.
6203	2024-02-21	0	Device malfunction	Industrial	Fixed gauge	The licensee discovered a fixed gauge with a shutter stuck in the partially open position. The malfunction was caused by an excess of grease that froze during harsh weather conditions. A licensed service provider repaired the device on site, and it was leak tested and returned to service. The licensee reminded staff to be cognizant of warning signs indicative of potential recurrence so any issues can be pre-emptively corrected. There were no unplanned exposures because of this event.
6207	2024-02-22	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that one of their vehicles, transporting 3 packages containing medical isotopes (Tc-99m), was rear-ended in a MVC. There was minor damage to the vehicle and no damage to the packages.
6206	2024-02-22	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that during an administration of Tc-99m to a patient, where the patient's spouse was assisting to hold the patient still, the spouse's fingers were contaminated with a few drops of the Tc-99m. The affected area was washed several times until readings no longer decreased. The dose to the hand was estimated to be 6.36 mSv which is below regulatory limits for members of the public. The licensee has developed guidance for when family members assist during a patient administration

						including providing them with appropriate personal protective equipment, like gloves.
6212	2024-02-23	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that a shutter on a fixed gauge was stuck in the open position. A licensed service provided attended the site to assess and repair the gauge. Staff recommended that the licensee increase the frequency of regular maintenance checks. There were no overexposures as a result of this event.
6211	2024-02-27	0	Breach of security	Academic	Other	The licensee reported that during a bi-annual security system response test, an issue was discovered. The licensee implemented other security measures until the system was repaired. There was no unauthorized access to the nuclear substances.
6213	2024-02-27	0	Breach of security	Industrial	Portable gauge	The licensee reported a theft at their storage location. While a survey meter and some documentation were stolen, it did not appear as though they tried to access the specific storage area of the nuclear gauges. No radiation devices were stolen.
6214	2024-03-01	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that a shutter on a fixed gauge was stuck in the closed position. A licensed service provided attended the site to assess and repair the gauge. There were no overexposures because of this event.
6221	2024-03-06	0	Device malfunction	Industrial	Portable gauge	The licensee reported that a shutter on a portable gauge was stuck in the open position. The licensee tagged and securely stored the gauge. A worker followed the manufacturer guidelines and was able to correct the issue, so the gauge was returned to service. The licensee reminded workers to perform shutter checks prior to transport and increased the planned frequency of gauge maintenance refresher training. There were no overexposures as a result of this event.

6220	2024-03-06	0	Device damaged	Industrial	Industrial radiography	The licensee reported that an exposure device was damaged when it was dropped from a height of 16 feet due to the use of an unapproved lifting system and improper rigging. The exposure device was removed from service for a full inspection and leak testing. Leak test results were normal. The licensee reminded employees to only use approved lifting systems and provided refresher training to applicable workers.
6224	2024-03-07	0	Lost	Medical	Radiation therapy	The licensee reported that they had lost an I-125 seed during a seed implantation protocol for treatment. The licensee searched the premises but could not find the sealed source. The licensee suspects that the seed stayed in the needle and was disposed of with the sharp biological waste. There are no anticipated effects as a result of this loss.
6223	2024-03-07	0	Lost	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that they had lost an I-125 seed during a seed implantation protocol for tumor localization. The licensee searched the premises but could not find the sealed source. The licensee has updated their procedures to prevent a recurrence. There are no anticipated effects as a result of this loss.
6225	2024-03-13	0	Spill	Commercial	Isotope production	The licensee reported that a major spill of F-18 occurred during quality control procedures when the vial was accidentally tipped over. The spill was contained in a well shielded L-Block and posed no risk to workers. The spill was cleaned and there was no skin contamination. Electronic personal dosimeter readings did not show any unusual readings. The procedure for opening the vial has been updated to prevent a recurrence.

6226	2024-03-14	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that the shutter on a fixed gauge was stuck in the closed position. The handle on the shutter had fallen off as a result of the age of the gauge and heavy vibrations in the operating environment. The affected operation line was shut down until the gauge was removed and disposed of by a licensed service provider. There were no overexposures because of this event.
WNSL-2	2024-03-14	0	Other	Commercial	Waste nuclear substances	The licensee reported a false fire alarm that occurred as a result of a faulty smoke detector. The fire department was notified immediately upon alarming. The licensee contracted a third party to replace the faulty smoke detector.
6227	2024-03-18	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that one of their vehicles, transporting 6 packages containing medical isotopes (Tc-99m) and 7 excepted packages, was rear-ended in a MVC. There was minor damage to the vehicle and no damage to the packages.
6232	2024-03-21	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was run over by a vehicle on a construction site. The source was in the shielded position when the accident happened. A leak test was performed and no leak was found. A licensed service provider assessed the damage and deemed it to be unrepairable, and the gauge was disposed of. The licensee discussed the seriousness of the event with all technicians and reviewed their responsibilities in ensuring the safeguarding of the gauge when not in use. They have also updated their training and written procedures with regards to checking around a vehicle before moving it.
6233	2024-03-21	0	Device damaged	Industrial	Portable gauge	The licensee reported that the screen on a portable gauge was damaged when a hammer was dropped on it. The gauge was repaired and returned to service.

6238	2024-03-22	0	Breach of security	Medical	Radiation therapy	The licensee reported that a high dose rate (HDR) brachytherapy room was left unsecured when there was no authorized user present. All nuclear substances were accounted for. This was a repeated event for this licensee and a revised site security plan was submitted and approved. A security inspection was planned.
6234	2024-03-22	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of greater than 100 EQs of Tc-99m with skin contamination. A vial slipped from the tongs when it was being transferred and broke behind the shielded screen in the fume hood. The area was isolated and subsequently cleaned. The technologist washed her hands immediately and the dose to the hands was negligible. The licensee is looking at options for better gripping tongs.
WNSL-3	2024-03-24	0	Transport issue	Commercial	Waste nuclear substances	The licensee reported that a driver of a truck carrying nuclear substances heard the load shift during transport. Upon investigation, the driver noted that one of the packages was dented. The licensee sent staff to assess the damage. They concluded that the damage did not impair the ability of the package to meet requirements and there was no release of nuclear substances. The licensee will verify the securement of all loads secured by client and contractor staff. They will undertake a review of their training and quality control processes.
6236	2024-03-26	0	Transport issue	Commercial	Processing of nuclear substances	The licensee reported a spill of greater than 100 EQ of F-18 as a package was being prepared for transport. As they were putting the shipping container into a shipping pail, the handle broke off the container and the vial inside was shattered. Preliminary cleaning was done and the area was isolated until the next day. The licensee inspected all containers of the same type and

						discarded 3 of them. There was no skin contamination. There were no overexposures because of this event.
6244	2024-03-28	0	Spill	Commercial	Isotope production	The licensee reported a spill of greater than 100 EQ of F-18 with personnel contamination during a production run of F-18. The cause was a line that discharges liquid waste from the synthesis module was outside the collection container, on the floor. Workers involved were estimated to have received a maximum effective dose of 2 mSv which was calculated using a conservative assessment. Their electronic personal dosimeters were reading in the μ Sv range. A committed effective dose by inhalation was estimated to be in very low μ Sv range. All workers involved were NEWs. There were no overexposures because of this event.
6239	2024-03-30	0	Breach of security	Commercial	Distribution	The licensee reported that there was a break-in at the site of the licensed activity. There was no attempt by thieves to access the gauge storage area and no loss of prescribed information.
6241	2024-04-02	0	Breach of security	Industrial	Portable gauge	The licensee reported that there was a break-in at one of their storage locations. There was no attempt by thieves to access the gauge storage area and no loss of prescribed information. Police were notified by the alarm system.
6242	2024-04-02	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that one of their vehicles carrying a portable gauge was involved in minor MVC. There was minor damage to the vehicle and no damage to the transport package. A leak test was performed, and no leak was detected.

6252	2024-04-09	0	Other	Medical	Radiation therapy	The licensee reported that they were performing some activities without the appropriate licence. All activities related to the production of radiation were ceased until the appropriate licence was granted.
6249	2024-04-11	0	Transport-MVC	Industrial	Industrial radiography	The licensee reported that one of their vehicles carrying an exposure device was involved in minor MVC. There was minor damage to the vehicle and no damage to the exposure device.
6278	2024-04-12	1	Unplanned exposure	Industrial	Portable gauge	The licensee reported that due to improper storage conditions, 6 technicians received doses in excess of the 1 mSv effective dose limit for members of the public (non-NEWs). The annual doses received by the 6 workers for 2021, 2022 and 2023 were estimated at 4.73 mSv, 3.46 mSv, 2.47 mSv, 1.64 mSv, 1.23 mSv, and 1.03 mSv. There are no adverse health and safety consequences, or appreciable increased risks, associated with these doses, which are well below the effective dose limits for NEWs, and roughly within the range of annual background radiation levels across Canada. The licensee took immediate actions to re-configure the storage location and added shielding in the form of concrete blocks. The licensee determined that the positions of the laboratory technicians will continue to be considered as non-New given that they do not work with portable gauges. An event initial report was presented to the Commission in September 2024.
6253	2024-04-12	0	Breach of security	Industrial	Fixed gauge	The licensee reported a cyber-attack on their systems. The licensee no longer had access to a variety of files so leak testing was not performed at the required frequency. Leak testing has since been performed and no leaks were detected.

6250	2024-04-12	0	Lost	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that they had lost an I-125 seed during a seed implantation protocol for tumor localization. The licensee searched the premises but could not find the sealed source. The licensee has updated their procedures to prevent a recurrence. There are no anticipated effects as a result of this loss.
6251	2024-04-15	0	Device malfunction	Industrial	Industrial radiography	The licensee reported that a locking mechanism on an exposure device was malfunctioning. After several attempts, the lock was successfully engaged, and the device was removed from service. The exposure device was sent for maintenance, and the likely cause of the malfunction was the accumulation of dirt or debris in the locking mechanism. The exposure device has been returned to service.
6257	2024-04-17	0	Lost	Medical	Radiation therapy	The licensee reported the loss of 2 I-125 seeds during 2 different medical treatments. In both cases, the licensee searched the premises but could not find the sealed sources. The licensee took measures to prevent recurrence including reminding operating room staff of the importance of keeping track of the seeds at sessions to be held twice a year, creating a checklist for staff to use during these procedures and supplying the pathology staff with a meter for use if a seed is dropped. There are no anticipated effects as a result of these losses.
6259	2024-04-17	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that one of their vehicles carrying a portable gauge was involved in minor MVC. There was minor damage to the vehicle and no damage to the transport package. A leak test was performed, and no leak was detected.

6261	2024-04-18	0	Spill	Commercial	Isotope production	The licensee reported a spill of greater than 100 EQ of F-18 in a fume hood with skin contamination. A cartridge containing the F-18 was being handled with tongs when it slipped and spilled. It was estimated that the skin dose to the worker in question (a student/trainee) was 79.7 mSv which is below the regulatory limit for skin dose to NEWs. The fume hood was left to decay. The licensee has taken precautions to prevent the recurrence of this type of event including limiting the amount of material handled by students, retraining lab staff on personal contamination procedures, procuring cartridges with a lock fitting and an additional contamination meter so that one is present where the work is performed.
6260	2024-04-18	0	Other	Industrial	Fixed gauge	The licensee reported a small fire that occurred approximately 10 feet from fixed nuclear gauges. The Emergency Response Team was activated, and the fire was put out within 15 minutes. The gauges were not impacted by the incident.
6262	2024-04-19	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that a projectile came off a transport truck and damaged the bumper of a vehicle carrying cases with trace amounts of Tc-99m (medical isotopes). There was no damage to the packages, and the driver was able to continue on.
6264	2024-04-19	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of greater than 100 EQ of Tc-99m with personnel contamination. The incorrect sized lead pig was used to ship a syringe, causing the syringe to depress releasing some TC-99m and contaminating the package. The dose to the technologist's skin was estimated to be 48.6 μ Sv. Due to the low dose rate from the package (40 μ Sv/hour), the short duration of the trip (15 minutes) and the placement of the package at least 1 meter from the courier driver, the dose to the driver would be well

						below the regulatory limit for members of the public. The technologist who shipped the syringe and the contaminated package was removed from that type of work until refresher training was performed.
6265	2024-04-19	0	Lost	Academic	Other	The licensee reported the loss of 38 smoke detectors that contain Am-241 and Ra-226. The licensee subcontracted a hazardous waste company to hold onto the smoke detectors for eventual transfer to a CNSC licensee for preparation/shipment to a long-term radioactive waste management facility. After 4 months, the company informed the RSO for the licensee that the smoke detectors could not be located at their facility. After three days of searching at the hazardous waste facility, the search was terminated to avoid other potential safety hazards. There are no anticipated effects as a result of these losses.
6274	2024-05-01	0	Unplanned exposure	Industrial	Industrial radiography	The licensee reported that a worker (member of the public) was not seen during a sweep to remove people from inside the barrier during an industrial radiography exposure. Upon investigation, the worker was approximately 110 feet away during the exposure, on a different level. The dose to the worker was estimated to be less than 25 μ Sv. Corrective actions were put in place including changing times for exposure windows to the middle of the night, equipping the sweep crew with whistles and updating refresher training to reinforce sweeps of areas difficult to see/access.

6279	2024-05-02	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of greater than 100 EQ of Tc-99m with personnel contamination when the technologist dropped a syringe in a syringe shield. The syringe landed on the plunger, causing a spray of Tc-99m onto the worker's gloves. After removing the gloves, contamination was found on one hand. The dose to the technologist's hand was estimated to be 16 mSv. The licensee reminded staff to regularly change their gloves with extended use, and they are trialing gloves made of a thicker material.
6282	2024-05-03	0	Device malfunction	Medical	Radiation therapy	The licensee reported that a door closure interlock malfunctioned. Emergency procedures were followed. A technician from the service provider was onsite for another reason and determined the issue was a bandage that fell from the patient. The bandage was removed, and the door works as expected.
6280	2024-05-06	0	Lost	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that they had lost an I-125 seed during a seed implantation protocol for tumor localization. The licensee searched the premises but could not find the sealed source. The licensee has updated their procedures to prevent a recurrence. There are no anticipated effects as a result of this loss.
6291	2024-05-13	0	Contamination Incident	Commercial	Isotope production	The licensee reported that a NEW contaminated their thumb with F-18 while removing gloves that were contaminated as a result of a defective needle. The licensee estimated the dose to be 77 mSv to the hand. Production workers are now required to double glove if going into a hot cell and refresher training will be given on proper donning/doffing protocols.
6287	2024-05-13	0	Device damaged	Industrial	Industrial radiography	The licensee reported that a source could not be returned to its shielded position in the exposure device. Workers trained in source retrieval attended and were able to safely retrieve the source. The exposure device was removed from service and sent for full

						maintenance. There were no overexposures as a result of this event.
6302	2024-05-21	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that they discovered 2 fixed gauges with shutters that would not open properly due to the harsh operating environment. The licensee contacted a licensed service provider to clean the shutters, and the gauges were returned to normal service. There were no overexposures because of this event.
6306	2024-05-28	0	Transport Issue	Commercial	Distribution	The licensee reported that a package containing a Mo-99/Tc-99m generator was damaged upon receipt and the Styrofoam insert was slightly crushed. There was no leak found and the generator itself was undamaged.
6310	2024-05-29	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that one of their vehicles, carrying a portable gauge, was involved in a motor vehicle collision (MVC) with a moose. There was no damage to the package or to the portable gauge. There was no injury to the driver. The licensee has opted to register all TDG certified technicians for a driver skills assessment.
6309	2024-05-29	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of greater than 100 EQ of N-13. A vial of N-13 was sent by pneumatic system from the cyclotron and the vial was broken when it arrived at its destination. There was no personal contamination. Upon investigation, the licensee discovered that the sleeve inside the lead container was too big for the vial, allowing movement. The licensee has made multiple sleeves of the appropriate size to prevent a recurrence. There was no overexposure as a result of this event.

6320	2024-05-30	0	Spill	Commercial	Isotope production	The licensee reported a spill greater than 100 EQ of F-18 that occurred when a worker's hand slipped while capping a vial causing the F-18 to spray. The worker had contamination on clothing (lab coat, shoes, lanyard), but no skin contamination. All surfaces were decontaminated and contaminated items were stored for decay. To prevent recurrence, the licensee reviewed procedures with the worker, including securing lids on vials before moving them. There was no overexposure because of this event.
6311	2024-05-30	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that one of their vehicles, transporting 3 Type A packages containing medical isotopes (Tc-99m) was rear-ended in a MVC. There was no damage to the packages, and the driver was able to continue the delivery.
6316	2024-05-31	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that one of their vehicles transporting 3 Type A packages containing medical isotopes (Tc-99m) was involved in a minor MVC when it struck debris on the road. There was no damage to the packages, and the driver was able to continue the delivery.
6317	2024-05-31	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that one of their vehicles, transporting excepted packages containing trace amounts of Tc-99m struck another vehicle during a lane change. There was minor damage to the vehicle and no damage to the packages.
6318	2024-06-01	0	Transport Issue	Commercial	Processing of nuclear substances	The licensee reported that a damaged package containing In-111 was received at Toronto Pearson Airport. There was minor damage on the top of the box. The consignee went to the airport to inspect the package. Other than a tear in the top of the box, there was no evidence of leaking, so they took the package to its intended location.

6322	2024-06-03	0	Transport-MVC	Industrial	Industrial radiography	The licensee reported that one of their vehicles, transporting an exposure device, was involved in a MVC when the driver of the vehicle did not have time to stop and read-ended a tractor trailer that stopped unexpectedly in front of them. The exposure device was moved to another vehicle by the licensee and sent for full inspection and no damage was found. The truck was damaged, and the driver was treated for minor injuries.
6321	2024-06-03	0	Lost	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that an I-125 seed removed along with a tissue sample from the patient could not be found during sample processing. After searching the area several times, the licensee was able to find the seed. There was no overexposure as a result of this event.
6324	2024-06-05	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that one of their vehicles, carrying a portable gauge, was involved in a MVC when it collided at low speed with another vehicle due to poor road conditions (slick with mud due to heavy rains on a worksite). There were no injuries and no damage to the package or the portable gauge as a result of this event.
6332	2024-06-06	0	Breach of security	Medical	Radiation therapy	The licensee reported a security related event for which no additional information can be shared as it involved prescribed information. The licensee took measures to address the issue.
6325	2024-06-06	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was struck by a front-end loader while it was parked on a construction site. There was no damage to the package or the portable gauge inside. There were no injuries as a result of this event.
6329	2024-06-07	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was rear-ended by a small van causing minor damage to the vehicle. There was no damage to the

						package or the portable gauge inside. There were no injuries as a result of this event.
6330	2024-06-12	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was involved in a MVC when it hit the side of a buggy cart at low speed when making a right-hand turn. There was minor damage to the vehicle with no damage to the package or the portable gauge inside. There were no injuries as a result of this event. The technician was requested to review the licensee's safe driving policies and procedures to ensure caution is taken when driving and transporting nuclear gauges.
6326	2024-06-12	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that one of their vehicles, transporting excepted packages containing trace amounts of Tc-99m was struck by a projectile from maintenance equipment on the highway. There was minor damage to the vehicle and no damage to the packages.
6333	2024-06-13	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of more than 100 EQ of I-131 that occurred during the administration of a treatment dose using liquid I-31. Contamination was found on the floor and surrounding equipment but there was no personnel contamination. Appropriate thyroid screening was performed on all the staff involved and no uptakes were recorded. The root cause of the event was related to the patient's ability to swallow properly. The hospital is working with speech pathologists to update protocols to include when a swallow assessment may be required.

6335	2024-06-14	0	Breach of security	Academic	Other	The licensee reported that an alarm was triggered during the night due to loss of communication, possibly related to a thunderstorm. Internal procedures were not followed, leading to a continuous alarm state for the remainder of the night. There was no unauthorized access to the site. All security deficiencies were addressed.
6351	2024-06-14	0	Device malfunction	Medical	Radiation therapy	The licensee reported that during routine operations, they observed that an indication light on the area radiation monitor was not functioning. The failure of the "ok light" was a possible indication that the area monitor was not working properly. In response, tests were conducted to verify the unit's functionality. As a precautionary measure, a survey meter was placed inside the treatment room to provide a secondary reference. A new area radiation monitor was subsequently installed.
6334	2024-06-14	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a portable gauge fell out the back of a pickup truck and dragged for about 100 meters due to improper closing of the tailgate and load securement. Neither the package nor the portable gauge was damaged. The worker in question was coached on the proper securement of portable gauges and the incident was discussed with all local RSOs and an article on this topic was shared in a newsletter that goes to all staff.
6337	2024-06-18	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was involved in a minor MVC when backing up at low speed. There was no damage to the package or the portable gauge inside. There were no injuries as a result of this event.

6338	2024-06-19	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was struck and damaged by a truck on a construction site when it was left unattended when the operator returned to their vehicle to get additional supplies. The operator was able to retract the source. Dose rate readings were normal, and no leaks were detected. The gauge was sent for repairs. All technicians were reminded of the importance of not leaving a gauge unattended.
6339	2024-06-20	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was struck and damaged by an excavator on a construction site when it was left unattended. Dose rate readings were normal, and no leaks were detected. The gauge was sent for disposal. The licensee re-trained and field audited the worker in question. Criteria for becoming an authorized user were refined and training and field documents were updated to address security in the field.
6340	2024-06-21	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was involved in a MVC when it went through a stop sign, hit another vehicle, and ended up in the ditch. The vehicle was significantly damaged, but the driver only sustained minor injuries. The transport package sustained minor damage (gouges in the outer shell of the box) but the gauge itself was not damaged. A new Type A package was obtained by the licensee. A meeting was held with all staff to emphasize and highlight safe driving, distracted driving and gauge safety.
6341	2024-06-24	0	Device malfunction	Industrial	Fixed gauge	The licensee reported a sticking, but still functional, shutter mechanism on a fixed gauge. The shutter is to be repaired or replaced by a licensed service provider at the next shutdown. There was no risk of exposure from this event.

6344	2024-06-26	0	Device malfunction	Industrial	Portable gauge	The licensee reported that a portable gauge had a shutter stuck in the partially open position. Upon closer examination at the storage location, dirt and debris were found to be the cause of the stuck shutter and it was easily cleaned. The gauge was able to return to service. The licensee reminded workers not to transport gauges with the shutter open. Due to the low dose rate with a partially open shutter, the distance from the driver and the short travel time, the dose to the worker was estimated to be less than 1 μ Sv.
WNSL-4	2024-06-27	0	Breach of security	Commercial	Waste nuclear substances	As this was a security-related event, no additional details will be shared.
WNSL-5	2024-06-28	0	Transport Issue	Commercial	Waste nuclear substances	The licensee reported that they performed an incomplete activity assignment of client material shipped to a lab for analysis. The sample material in the package was classified as exempt, but the lab/receiver identified that contents exceeded exemption limits. The licensee took corrective action to implement a new quality control process for all exempt shipments and now requires outbound shipments classified as exempt to receive Radiation Safety Officer/Health Physicist approval. This event was also reported by another WNSL who received the misclassified shipment.

6347	2024-07-02	1	Stolen	Industrial	Portable gauge	The licensee reported that a portable gauge was missing from a construction site. The gauge was meant to be shipped back on a plane with the authorized user, but the gauge was not accepted on the flight due to additional time needed for inspection. The technician was not made aware that the gauge was not on the plane. The licensee contacted the construction company and instructed them on how to transport and secure the gauge until it could be shipped back. Days later, the construction company noticed the gauge was missing. The RCMP and local First Nation were notified of the loss. The gauge was found by the RCMP in a wooded area close to the construction site. The case lock was still intact, and upon opening the case, the shutter lock was also intact, and the gauge was undamaged. Internal procedures were updated to reflect inspection time when boarding a flight with a gauge.
6350	2024-07-03	0	Breach of security	Medical	Radiation therapy	The licensee reported that a high dose rate (HDR) brachytherapy room was left unsecured when there was no authorized user present. All nuclear substances were accounted for. This was a repeated event for this licensee. A security inspection was planned.
6349	2024-07-09	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of greater than 100 EQ of TC-99m. While administering the dose to a patient, the intravenous (IV) line became disconnected. Absorbent pads were able to contain the spill and there was no personal contamination. Staff were reminded to check that the IV tubing is secure prior to injecting the radiopharmaceutical.

6353	2024-07-10	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was involved in a single vehicle MVC. There was damage to the vehicle and the driver was taken to the hospital. The RSO retrieved the gauge from the accident site and there was no damage to the package or the portable gauge itself. The licensee sent an email to all staff reiterating the importance of following the rules of the road.
6354	2024-07-10	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that a fixed gauge was found with a shutter stuck in the open position. All work around that vessel is prohibited. A service provider was unable to repair the shutter. Until such a time that the gauge can be replaced, no work is permitted in the area. There is no risk of exposure due to this event.
6356	2024-07-12	0	Device malfunction	Commercial	Calibration	The licensee reported that a breaker tripped when charging a calibration device. While there was no visible spark, there was some carbon scoring on the case and its components. A loose cable may have been the cause. Subsequently, all plugs have been converted to GFCI plug-ins.
6361	2024-07-15	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was struck by a left-turning vehicle who failed to yield the right of way. There was minor damage to the vehicle but no injury to the driver. The package and the gauge did not sustain any damage, As a precaution, a leak test was done, and no leak was found.
6360	2024-07-15	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that a vehicle carrying medical isotopes was involved in a MVC in a major construction zone when another vehicle struck them as a result of being in the incorrect lane. There was damage to one side of the vehicle and air bags were deployed. After assessment, the driver was released from the hospital. There was no damage to the package and another driver retrieved it and made the delivery.

6365	2024-07-19	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was involved in a MVC when the vehicle struck the rear of the vehicle ahead when it stopped suddenly. There was minor damage to the vehicle but no injury to the driver. The package and the gauge did not sustain any damage. As a precaution, a leak test was done, and no leak was found. The driver is registered to complete a driver skills assessment.
6366	2024-07-21	0	Other	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a flood in a nuclear medicine department due to heavy rain. No nuclear substances were impacted.
6369	2024-07-24	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that while attempting to lock out the fixed gauges, 2 units were found to have stuck shutters. A licensed service provider was brought in and the shutters were both fixed. The likely cause is related to the environment they are used in. The devices are on a regular preventative maintenance schedule.
6370	2024-07-25	0	Device malfunction	Industrial	Portable gauge	The licensee reported that the shutter of a portable gauge was stuck in the open position while at a worksite. The assistant RSO attended the site, and they were able to remove dirt and debris from the shutter mechanism. As a precaution, the gauge was sent for full servicing. The licensee reminded workers to keep the equipment clean at all times.
6372	2024-07-30	0	Device malfunction	Commercial	Isotope production	The licensee reported that the flow meter and detector system in the stack were not working as expected. A contingency plan was implemented until the system was repaired. There were no unplanned exposures because of this event.

6374	2024-07-30	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that a vehicle transporting 4 excepted packages containing trace amounts of Tc-99m was involved in a 5-car MVC. There was no damage to the packages and no injury to the driver. Despite the collision not being the fault of the driver, they will take a defensive driving course as they were stressed after the accident.
6375	2024-07-31	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that while attempting to close the shutter on a fixed gauge to perform annual leak testing, the source holder broke off its mounts. The shielding remained intact, but the shutter was stuck in the open position. The area was blocked off to workers and a licensed service provider was contacted. They were able to close the shutter and relocate the device to a secure storage locker. The licensee has made arrangements to dispose of the gauge and replace it with a new one. There were no overexposures because of this event.
6378	2024-08-07	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that a shutter was stuck in the open position on a fixed gauge. A licensed service provider dismantled the gauge and placed it in secure storage until it could be disposed of. There was extensive corrosion so the gauge could not be returned to normal service. There were no unplanned exposures because of this event. The licensee will continue with their checks of all gauges every 6 months.
6379	2024-08-07	0	Transport Issue	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that they received two damaged Type A packages containing sealed Co-57 sources. The exterior of the packages was checked to confirm that there was no contamination. The inner packaging was not damaged.

6381	2024-08-14	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that one of their vehicles was hit by another vehicle when that vehicle swerved into oncoming traffic. There were 10 packages containing medical isotopes (Tc-99m and I-131) onboard. There was no damage to the packages and another driver picked up the packages and completed the delivery. Upon delivery contamination checks were performed and no contamination was found. The vehicle had to be towed but there was no injury to the driver.
6386	2024-08-15	0	Device malfunction	Medical	Radiation therapy	The licensee reported that the irradiation status displays within the maze were not installed because a part was on back order. The licensee put in place a temporary solution that was approved by the CNSC until the status display was repaired and functional.
6384	2024-08-16	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was struck by the employee's own vehicle on a construction site. As they were about to put their gauge back in its case, they received a phone call and took the call in the vehicle due to the noise. After ending the call, they forgot that their gauge was beside the car and started reversing. The guide rod was broken but the source remained in the shielded position. A leak test was performed, and no leak was found. The gauge was sent for repair. The technician in question was reminded of the circle check around a vehicle requirement that had recently been put in place and refresher training was given on storage requirements when not in use. Information was shared with all staff so they understood the possible impacts of damaging a gauge or leaving it unattended.

6388	2024-08-17	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was struck by the employee's own vehicle on a construction site. They left the gauge at the back of the truck when they went to retrieve more equipment which they placed in the backseat of the vehicle. They needed to move to a new location to do more measurements on the site and forgot the gauge was not in the truck. They reversed and broke the handle on the gauge. The source remained in the shielded position. The source was sent to be repaired. The technician in training was required to have a competency check before using the gauges again and was reminded to walk around the vehicle before moving it to ensure there are no hazards.
6390	2024-08-19	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that one of their vehicles carrying a portable gauge was hit on the passenger side when another vehicle tried to change lanes. There was minor damage to the vehicle and no injury to the driver. Neither the package, nor the gauge, sustained any damage.
6393	2024-08-22	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that one of their vehicles carrying medical isotopes (Tc-99m and F-18) braked to avoid a deer only to strike another deer that ran into the road in the early morning hours. The vehicle was damaged, but the driver was not injured. The packages were undamaged, so another driver arrived to complete the delivery. The licensee has some vehicles equipped with deer whistles and these are to be prioritized for longer trips such as this one, however, in this case, the vehicle was not equipped with one.

6397	2024-08-22	1	Unplanned exposure	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that a nurse (non-NEW) received a dose of 1.27 mSv during the care of child who received a high dose I-131 in patient treatment. She was responsible for the child's care on Day 1 of the therapy. The patient was unwell and non-compliant with taking medication so more care than usual for this type of patient was required. Direct reading dosimeter results were high, so the nurse's dosimeter was sent in for immediate reading. The nurse was removed from any duties involving the care of patients receiving high dose therapies for the remainder of the year. In addition to refresher training for all staff involved in these therapies, the licensee has also updated their protocols and set limits for direct reading dosimeters. The RSO will also be on-call 24 hours per day for support during high dose therapies.
6394	2024-08-23	0	Device malfunction	Medical	Radiation therapy	The licensee reported that during morning quality assurance procedures, they found that the beeping sound of the HDR unit was not working when they attempted to open the door with the beam on. All other safety systems were confirmed to be working including the beeping sound from the console. The equipment was fixed and all safety features are functioning.
6395	2024-08-23	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that during a lock out procedure in preparation for a vessel entry, the shutter on a fixed gauge was found to be stuck in the open position. The vessel entry was cancelled, and all staff were notified that no vessel entry could take place until repairs were made. Upon investigation, it appears as if excess vibration in the screw system had damaged the shutter mechanism. The gauge was removed by a service provider and replaced with a new one. All other gauge

						shutters were checked for functionality. There were no unplanned exposures as a result of this event.
6409	2024-08-24	0	Unplanned exposure	Industrial	Industrial radiography	The licensee reported that a worker (non-NEW) located on the other side of a shared wall was inadvertently exposed during industrial radiography work in a fabrication shop. After investigation, the dose to this worker was estimated to be 29 μSv , well below the effective dose limit for a member of the public. It appears that insufficient barriers were set and surveys at the barriers were not performed frequently enough. The licensee has put in place measures to prevent recurrence including addition mobile shielding, more frequent radiation level checks, and work being performed outside in the yard when practicable.
6401	2024-08-26	0	Transport-MVC	Industrial	Industrial radiography	The licensee reported that a truck carrying an exposure device hit a concrete barrier when the front tire blew causing a loss of control. There was no injury to the driver. There was no damage to the exposure device. It was surveyed, and no abnormal readings were found. The device was transferred to another licensee's truck and returned to the storage location. As a precaution, a full inspection was performed.

6403	2024-08-28	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was damaged by a hydraulic shovel on a construction site. The source remained in a shielded position. The handle and guide tube were damaged. The gauge was placed into its Type A package and transported to the office and a leak test was performed. No leak was detected. Employees were reminded of the importance of keeping the gauge under their supervision when in use and locked in its transport case when not in use. The gauge was not repairable and has been transferred for disposal.
6404	2024-08-28	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge rear-ended another vehicle in an intersection in a minor collision. There were no injuries and no damage to the gauge. As a precaution, a leak test was performed, and no leak was found. The driver attended a proactive driving course.
6405	2024-08-28	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable nuclear gauge was run over by a skid steer on a construction site when it was left unattended for a short period, causing a crack in the plastic casing. The source was in a shielded position. After confirming normal dose rate readings, the gauge was placed into its Type A package and transported to the office. A leak test was performed, and no leak was found. The gauge was sent to a licensed service provider for repairs. All gauge operators were reminded of the proper handling, use and storage of portable gauges and the importance of not leaving them unattended at any time.
6406	2024-09-01	0	Transport Issue	Commercial	Distribution	The licensee reported that a Type A package containing a Mo-99/Tc-99m generator was found damaged (wet) at Toronto Pearson Airport. Upon investigating, it was determined that the package was not leaking, and it was simply wet. The licensee sent a trained person to

						repack the generator, and it continued on to its destination.
6410	2024-09-05	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of greater than 100 EQ of Tc-99m that occurred when the bottom of a vial broke off (no contact was made, the vial seemed to burst). Contaminated personal protective equipment was removed and stored for decay. The workstation was cleaned and then left to decay. There was minor skin contamination that was cleaned immediately. The licensee contacted the supplier to inform them of the breakage.
6414	2024-09-09	0	Breach of security	Industrial	Portable gauge	The licensee reported that a worker temporarily left their vehicle unattended, on a secluded road, and when they returned, they saw someone breaking the lock on the transport package containing a portable gauge which was located in the bed of the truck. The person ran away when the driver approached. The lock was cut but the gauge was not damaged. The driver put the gauge into the cab of the truck until they could get a new padlock. Although the driver followed the licensee procedures, the licensee has reassessed their procedures to make specific changes related to the parking locations, theft deterrents and vehicle rental specification for securing gauges when covers are not available.
6422	2024-09-11	0	Device malfunction	Commercial	Isotope production	The licensee reported that the cyclotron maze audible alarm was not malfunctioning. Compensatory measures were put in place until the alarm was repaired. A loose connection was found to be the issue.
6421	2024-09-12	0	Breach of security	Academic	Lab studies and consolidated use	The licensee reported that the door was propped open and a room was left unattended for approximately 7 minutes. The licensee was able to confirm that the authorized user had not followed procedures. There was no unauthorized access during this period. Updates

						were made to the site security plan in response to this event.
6416	2024-09-12	0	Breach of security	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that 2 contractors were given unauthorized access to the hot lab to perform maintenance on the weekend. It appears that maintenance staff did not follow any of the requirements and allowed the contractors to access the area to complete their work. There were no overexposures because of this event.
6420	2024-09-13	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was rear-ended at a traffic light. There was minor damage to the vehicle, no injuries and no damage to the package or the gauge inside. As a precaution, a leak test was done and no leak was found.
WNSL-6	2024-09-13	0	Other	Commercial	Waste nuclear substances	The licensee reported a false fire alarm that was related to renovation work producing a dust cloud in a laboratory. When the alarm sounded, there was a delay in security notifying the fire department regarding this fire alarm. The licensee installed and commissioned a third-party Operational Dispatch System that notifies emergency services directly in the case of fire alarms. They have also scheduled additional fire alarm drills.
6440	2024-09-15	0	Transport Issue	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported they had received a package containing a Mo-99/Tc-99m generator that had small tears in the outer package. The inner packaging and the generator were undamaged. Swipes were taken and no contamination was found. The consignor was notified of the damage.

6425	2024-09-17	0	Device damaged	Industrial	Industrial radiography	The licensee reported that an exposure device being used in a trench was flooded due to heavy rains. It was removed from the trench using remote controls. The source was in a shielded position and surveys did not show any unusual dose rates. The device, controls and guide tube were removed from service and were fully inspected. Workers were instructed on hazard to watch for when doing a job hazard assessment and this will be added to refresher training in 2025
6428	2024-09-20	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge hit a deer. There was damage to the vehicle but no injuries to the driver. There was no damage to the package or to the gauge inside the package. Radiation surveys and the leak test were normal.
6430	2024-09-22	0	Device malfunction	Industrial	Industrial radiography	The licensee reported that a exposure device had malfunctioned. The exposure device operator was able to retract the source but not to its fully shielded position. After investigation, the sealed source assembly had become disconnected from the cable. After several attempts, the licensee was able to retract the source to its fully shielded position. The equipment was red tagged and returned to the manufacturer for inspection. A maximum of 5 μ Sv was received by the recovery team.
6431	2024-09-23	0	Breach of security	Medical	Radiation therapy	The licensee reported that a software upgrade had led to false alarms of the motion detection system. As a contingency, a security guard was posted until the issue was resolved. There was no unauthorized access during this time.
6432	2024-09-23	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that during routine shutter checks and leak testing, a fixed gauge was found with a shutter stuck in the open position. Due to the location of the gauge there is no risk to workers. A new gauge

						will be installed and the old gauge transferred for disposal in May 2025.
6429	2024-09-23	0	Breach of security	Medical	Diagnostic and therapeutic nuclear medicine	A door into the nuclear medicine department was found to be propped open with a sign after the weekend. All nuclear substances were accounted for. There is a sign indicating that the door must be kept closed, however it appears that cleaning staff may have propped it open on the weekend. Environmental services have been asked to ensure staff working weekends are aware of the requirements regarding security.
6438	2024-09-28	0	Device damaged	Industrial	Portable gauge	The licensee reported that as a technician was preparing to take measurements with a portable gauge, a dozer drove in very close proximity to the technician and pushed the gauge for a fair distance before stopping. The source was in a shielded position, but the gauge was severely damaged. Survey readings indicated that it was safe to transport in its Type A package. Leak testing confirmed there was no leak. Although the fault lay fully with the dozer operator, the licensee took a number of actions to avoid a recurrence including updating procedures and reminding staff about safety when working around large equipment.
6442	2024-10-01	0	Device malfunction	Industrial	Fixed gauge	The licensee reported that during annual leak testing, a worker noted that the sheer pin on the control arm that opens and closes the shutter had sheared off due to excessive rust. A service provided attended on site and inserted a new pin. All other gauges were verified and no issues identified. There were no unplanned exposures because of this event.

6446	2024-10-04	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was hit by smooth drum compactor on a construction site. The depth rod was broken but the source rod was able to be retracted into the shielded position. After confirming dose rates were acceptable, the gauge was sent for repairs. The worker was approximately 4 meters away when the compactor began reversing quickly. They were not able to retrieve the gauge before getting out of the way. The worker was retrained on policies related to portable gauges and an email was sent to all staff.
6447	2024-10-07	0	Device damaged	Industrial	Portable gauge	The licensee reported that their portable gauge was struck by a reversing pick-up truck at low speed. The gauge was only a few feet from the worker, but they turned their back, and, in that time, the pick-up started reversing and knocked the gauge over. The source remained in the shielded position. Damage was limited to the screen on the gauge, and it was sent for repair. The licensee has updated their procedures so that anytime the gauge is out, the area should be flagged/cordoned off to be more visible. This event will be shared as part of lessons learned training.
6449	2024-10-07	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was involved in an accident with another vehicle. There was no damage to the package or the gauge inside the package. Radiation surveys and leak tests were performed as a precaution and results were normal. While the vehicle needed to be towed, there were no injuries.
6486	2024-10-10	0	Breach of security	Medical	Radiation therapy	The licensee reported that that one of the HDR treatment rooms was found unsecured for approximately 1.5 hours, when there was no authorized user/access present. The physicist had

						forgotten to secure the area properly. The licensee is providing refresher training on HDR security to all staff.
6454	2024-10-10	0	Other	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that the radiopharmacy was flooded as a result of a sewer backup which came up through drains in the floor. Maintenance personnel were given access to unclog the drains. There was no contamination and no releases as a result of this event.
6456	2024-10-10	0	Transport Issue	Medical	Diagnostic and therapeutic nuclear medicine	Toronto Pearson Airport reported that they had a package containing medical isotopes (Lu-177) that was slightly damaged by a forklift. The consignor confirmed that it could still be transported. However, due to the time delay in shipping the dose was returned to the consignor rather than continuing to its destination.
6463	2024-10-11	0	Breach of security	Medical	Radiation therapy	The licensee reported that 1 of the 3 security measures at the entry to the gamma knife vault was not functioning. Upon investigation, the security system was updated but the RSO was not informed so they did not test the system post-maintenance. The sources were secure and there is no evidence of unauthorized access during this period.
6457	2024-10-11	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was run over by a truck on a construction site when it reversed without its warning sound as the work was being done at night. The technician was on the phone and did not see the driver reversing and the gauge was run over. The source was in the shielded position when the accident happened and while survey results were normal, the gauge was badly damaged so was sent for disposal. The licensee reminded the technician to not be distracted while working and with large trucks where the blind spot is large, a worker will be used to guide the truck when reversing.

6458	2024-10-15	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was run over by an asphalt truck on a construction site when the technician was about 10 meters from the gauge. While the sources remained in the shielded position, the gauge was badly damaged. After confirming dose rate readings were acceptable, the gauge was returned to the storage location for eventual disposal. The licensee provided refresher training on handling gauges to all technicians and the technician in question will be required to take a full recertification course.
6459	2024-10-15	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was struck by another vehicle from behind. While the vehicle was damaged, there were no injuries and neither the package nor the gauge was damaged. As a precaution, the licensee performed a leak test and no leak was detected.
6460	2024-10-17	0	Device damaged	Industrial	Industrial radiography	The licensee reported that the source of an exposure device could not be returned into the camera. Trained workers in source retrieval went on site and were able to safely retrieve the source. The equipment was red tagged, taken out of service, and sent for full maintenance. No overexposure was received because of this situation.
6487	2024-10-18	0	Breach of security	Medical	Radiation therapy	The licensee reported that during a routine security patrol, a security guard discovered a component of the intrusion detection system was left unarmed in the HDR storage room when there was no authorized user/access present. All nuclear substances are accounted for. The security guard immediately secured the area by arming the component.
6462	2024-10-18	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was struck by another vehicle. While the vehicle was damaged, there were no injuries and neither the

						package nor the gauge was damaged. The gauge was assessed and was in good functioning order.
6544	2024-10-21	0	Breach of security	Medical	Radiation therapy	The licensee reported that the radioisotope storage room was found unlocked. This was as a result of human error. The second barrier was in place and the source was confirmed to be present. This is a recurring situation with this licensee, and they continue to work on implementing new security measures to address these issues.
6466	2024-10-22	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was rear-ended by another vehicle. The vehicle was badly damaged and there were minor injuries to the driver. Neither the package nor the gauge was damaged. Dose rate measurements and visual confirmed that the gauge was not damaged.
6489	2024-10-24	0	Breach of security	Medical	Radiation therapy	The licensee reported during routine security patrol, security guard discovered the door unlocked and the motion sensor was left unarmed in the HDR storage room when there was no authorized user/access present. All nuclear substances are accounted for. The security guard immediately secured the area.
6469	2024-10-25	1	Stolen	Industrial	Portable gauge	The licensee reported that a portable gauge was stolen. The operator took the gauge out of the Type A package and set it down on the ground behind their truck, then went to sit in the cab. When the operator got out of the cab, they found that the portable gauge was stolen. The situation has been reported to the local police. While the worker understood the company protocols for securing a gauge and not leaving it unsupervised, they were distracted and did not see the stranger around the vehicle. They were removed from working with

						portable gauges. Staff were all informed of the incident and the security of equipment was highlighted. The gauge remains unrecovered.
6545	2024-10-30	0	Breach of security	Medical	Radiation therapy	The licensee reported that the HDR room was found unalarmed as a result of human error. This is a recurring situation with this licensee, and they continue to work on implementing new security measures to address these issues.
6475	2024-10-30	0	Other	Industrial	Fixed gauge	The licensee reported that a fire occurred approximately 30 to 50 feet from the fixed gauges. The emergency response team was activated, and the fire was put out within 20 minutes. The gauges were not impacted by the incident and all the signage is intact.
6474	2024-10-30	0	Breach of security	Medical	Other	The licensee reported that there was an issue during the bi-annual alarm test. After investigation, the issue was resolved.
6485	2024-11-06	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was struck by another vehicle when it was stationary. There were no injuries. Neither the package nor the gauge was damaged. Dose rate measurements were confirmed to be normal. The gauge was assessed and was noted to be in good functioning order.
6488	2024-11-06	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was run over by a single drum roller on a construction site when the technician left the gauge to contact their supervisor with an operational question. While the sources remained in the shielded position, the gauge was badly damaged. After confirming dose rate readings were acceptable, the gauge was sent for disposal. The licensee put measures in place to avoid a recurrence including the use of spotters/flaggers for large equipment and using signs/cones or barriers around the gauge worksite.

6490	2024-11-07	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that a vehicle transporting 4 excepted packages containing trace amounts of Tc-99m was hit by another vehicle. There was no damage to the packages and no injury to the driver.
6547	2024-11-12	0	Breach of security	Medical	Radiation therapy	The licensee reported that the HDR room was found unalarmed as a result of human error. This is a recurring situation with this licensee, and they continue to work on implementing new security measures to address these issues.
6495	2024-11-18	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was rear-ended by another vehicle. There were no injuries. Neither the package nor the gauge was damaged. Dose rate measurements were confirmed to be normal. As a precaution, a leak test was done, and no leak was detected.
6497	2024-11-18	0	Transport-MVC	Industrial	Industrial radiography	The licensee reported that a vehicle carrying an exposure device was involved in an accident when another vehicle veered into the lane occupied by the licensee's vehicle. The exposure device was surveyed and remained locked with the source in the fully shielded position. It was determined to be in good operating condition. There were no injuries as a result of this event.
6498	2024-11-19	0	Transport Issue	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that Tc-99m was not properly packaged prior to transport. There were no unplanned exposures as a result of this event. The individual involved was reminded to contact the radiation safety team prior to transporting nuclear substances.

6499	2024-11-20	0	Unplanned exposure	Industrial	Industrial radiography	The licensee reported that a worker (member of the public) from a different company was made aware of radiography work in the area at a toolbox talk but still bypassed posted signage and entered the radiation area. After investigation, the dose to the worker was estimated to be 22 μSv which is well below the 1 mSv effective dose limit for a member of the public. The licensee will now add red tape to the signage that was already in place.
6501	2024-11-27	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that a vehicle carrying 9 excepted packages with trace amounts of Tc-99m and 1 Type A package with Tc-99m was in a minor accident at low speed in a parking lot. There was no damage to the packages and the driver continued with the deliveries.
6503	2024-11-28	0	Transport-MVC	Industrial	Portable gauge	The licensee reported that a vehicle carrying a portable gauge was involved in an accident when it struck a deer. There was no damage to the package or the gauge inside the package. There were no injuries as a result of this event.
6505	2024-11-29	0	Device damaged	Industrial	Fixed gauge	The licensee reported that that a source fell to the bottom of a vessel when trying to retract it back into an insertion-type fixed gauge. Dose estimates were done as time sensitive work needed to be completed in the area of the damaged gauge. Workers involved in this work were estimated to have received doses of less than 10 μSv . A licensed service provider was brought in to retrieve the source. A new gauge was installed and the old was transferred for assessment and disposal.
6510	2024-12-02	0	Breach of security	Medical	Radiation therapy	The licensee reported that the key was left in the brachytherapy console. The door was secured, and the door key was secured. After investigation, the medical physicist forgot to take the key out of the console. Staff were reminded to ensure that the console key is secured after arming and locking the room door.

6509	2024-12-03	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of more than 100 EQ of Lu-177 that occurred when the end of the burette that was connected to the IV-line set became detached. All contaminated clothing and shoes were removed and stored. Once the spill was contained, the room was left to decay for a period before decontamination efforts were undertaken. Remaining areas of fixed contamination were covered with lead shielding to lower the dose rates to acceptable levels so the room could be used for other treatments. Two technologists had minor skin contamination that was cleaned immediately such that readings were at background levels. The burettes with the same lot number have been removed from service and disposed of. There were no overexposures because of this event.
6511	2024-12-04	0	Transport-MVC	Commercial	Isotope production	The licensee reported that a vehicle carrying 4 excepted packages containing trace amounts of Tc-99m was involved in a minor MVC when the driver rear-ended another vehicle due to low visibility from the glare of the sun. The vehicle sustained minor damage, however there were no injuries. The packages were also undamaged.
6513	2024-12-04	0	Unplanned exposure	Industrial	Industrial radiography	The licensee reported that a security guard crossed the posted barrier during radiography work. The licensee conducted an investigation, and no radiographic exposure was performed at the time of the barrier breach, therefore, no radiation exposure to the individual. Annual refresher training will now include more information on the posting of signs at barriers and the importance of continuously monitoring the area for individuals who may have crossed the barrier.

6512	2024-12-04	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of greater than 100 EQ of Tc-99m in the hot lab. A technologist was moving the lead pig containing the vial of Tc-99m and knocked the bottom of the pig on something which caused the vial to fall out where it landed in a sink and cracked. There was no personal contamination, and the area was decontaminated following proper spill protocols. All staff were reminded to be aware of their surroundings and not to rush tasks.
6543	2024-12-09	0	Breach of security	Medical	Radiation therapy	The licensee reported that the HDR room was found unalarmed as a result of human error. This is a recurring situation with this licensee, and they continue to work on implementing new security measures to address these issues.
6516	2024-12-09	0	Device damaged	Industrial	Portable gauge	The licensee reported that a portable gauge was struck by the bucket of an excavator on a construction site causing damage to the gauge plastic top shell. The technician left the gauge unattended in an excavation site when going to the washroom, which is against company policy. The source was in a shielded position. The licensee conducted radiation surveys and confirmed normal levels. The gauge was placed into its Type A package and transported to the storage location. A leak test was performed, and no leak was found. The gauge was sent to a service provider for repair. The technician in question was reminded of their obligations and suspended from use of portable gauges for 30 days. The licensee has created a secure temporary storage area within the excavation site. In addition, all workers were informed of the incident and the possible consequences.
6518	2024-12-10	0	Spill	Commercial	Isotope production	The licensee reported a spill of greater than 100 EQ of F-18 during production in a hot cell when removing liquid from the delivery vial with a syringe. The spill

						was fully contained and there was no personal contamination.
6540	2024-12-11	0	Found	Academic	Lab studies and consolidated use	The licensee reported that they were contacted by a metal recycling facility as a load of waste originating from one of their sites alarmed a vehicle radiation monitor. The investigation revealed that it was a legacy smoke detector, manufactured in 1961 that contained 1.48 MBq of Ra-226. The detector was no longer in use and was taken down during some construction work. The source is back under regulatory control and will be stored prior to being sent for disposal. The licensee has identified a few more of these smoke detectors installed but not in use. They will ensure these are properly removed.
6531	2024-12-11	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of greater than 100 EQ of I-131 that occurred during the administration of a liquid treatment dose to a patient. A small area of contamination was found on the floor in front of the injection chair. A spill clean-up was conducted, and the remaining contaminated area was shielded, closed, and left for decay. No personnel were contaminated, and thyroid screenings were performed. All results were below regulatory limits. Their procedure was revised to include placing absorbent pads on the floor during administration.
6521	2024-12-12	1	Lost	Academic	Lab studies and consolidated use	The licensee reported that they had only received 1 of 2 packages each containing a static eliminator with 185 MBq of Po-210. The delivery of 2 packages was confirmed via the courier. After investigation and doing multiple searches, the missing, unopened package was found in another department. Moving forward, all packages containing nuclear substances must be delivered to the nuclear medicine department

						for logging purposes. Staff in the department where the package was found will have refresher training in the handling of packages containing nuclear substances.
6523	2024-12-13	0	Spill	Commercial	Isotope production	The licensee reported a spill of Zr-89 when production staff noticed that a vial had leaked in its lead pig. All contamination was limited to the inside of the lead pig. There was no personal contamination. The licensee theorized that the cap on the vial may not have been properly closed. Staff were reminded to ensure that vial caps are sealed tightly.
6550	2024-12-13	0	Spill	Commercial	Isotope production	The licensee reported a spill of Pb-203 that occurred during decrimping of a vial. The worker described using too much pressure, causing the vial stopper to fall out of the fume hood and land on his shoe and the floor. No skin contamination was reported. An electronic personal dosimeter worn by the worker measured a dose of 55 μ Sv. Most of the spill was contained in the fume hood. The licensee has changed their protocol so that decrimping is no longer necessary.
6522	2024-12-13	0	Transport-MVC	Commercial	Processing of nuclear substances	The licensee reported that a vehicle carrying 1 Type A package containing Tc-99m was involved in a collision when it struck a car making a left turn. The car was not visible to the driver as a large truck had stopped to allow the driver to turn left. There was significant damage to the vehicle but no injuries. The package was not damaged in the collision and another driver picked it up to deliver it to its destination. Drivers were reminded to be more vigilant in this area as there are many large trucks that can reduce the visibility of smaller vehicles turning into parking lots.

6535	2024-12-16	0	Other	Academic	Lab studies and consolidated use	The licensee reported a flood related to the failure of a water coil in a ventilation system. The water was cleaned up and the nuclear substances were not impacted in any way.
6524	2024-12-16	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported a spill of greater than 100 EQ of Tc-99m in the hot lab when the vial, used to milk the Mo-99/Tc-99m generator, fell out of its lead pig and dropped on the floor. The bottom of the lead pig was not screwed on properly. There was no personal contamination. The contamination was limited to a rubber standing mat, the floor and the technologist's shoes. The mat and shoes were stored for decay. The floor was cleaned and then left to decay overnight and cleaned again in the morning until levels were within limits on the licence. The RSO checked the structural integrity of the lead pigs to ensure they can be fastened and as part of continuous learning, informed staff that the probable cause of the event was a failure to properly secure the lead pig bottom.
6525	2024-12-17	0	Spill	Medical	Diagnostic and therapeutic nuclear medicine	The licensee reported that a spill of greater than 100 EQ of Ac-225 occurred when the lead pig, containing the vial, slipped from the technologist's hand and fell on the floor. The worker involved in the spill was monitored and no skin contamination was found. Their shoes were contaminated and were stored for decay. The spill and the area were cleaned up immediately following the incident. Staff were reminded to properly handle this type of lead pig at all times.
6539	2024-12-22	0	Transport-MVC	Industrial	Oil well logging	The licensee reported that a vehicle transporting well-logging sources (Am-241/Be and Cs-137) was involved in an accident when the driver lost control on the icy road and rolled the vehicle. There were no injuries, however the vehicle was a total loss. There was no

						damage to the transportation shields secured in the storage compartment at the back of the truck and dose rate readings were normal. The sources were transferred to another vehicle and returned to the storage location. Staff were reminded that speed should be adjusted based on road conditions and that the journey management plan must include discussions about weather and road conditions.
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Appendix K: Outreach and engagement activities

Table 29: Outreach and engagement activities in 2024

Date	Audience / Meeting attendees	Type of activity	Topics
January 2024	CNSC/industrial radiography working group representatives	Virtual meeting	<ul style="list-style-type: none"> Review of Action items Regulatory updates CSA PCP-09, Exposure Device Operator Personnel Certification Guide – Revision 1 update (Scheme committee) Planning for May meeting
January 2024	DNSR licensees	Targeted email	<ul style="list-style-type: none"> Update of REGDOC-2.5.6, Design of Rooms Where Unsealed Nuclear Substances Are Used
January 2024	InterACTIONS (Medical Physics Professionals)	Journal publication	<ul style="list-style-type: none"> Simplify your CNSC licence Appendix with a Facility Safety Report
April 2024	Northwest Nuclear Exploration Forum attendees (including members of the public and Indigenous Nations and communities)	In-person forum	<ul style="list-style-type: none"> Presentation on the role of the CNSC with specific information related to packaging and transport of nuclear substances (with a focus on the Nuclear Waste Management Organization’s proposed deep geological repository) CNSC booth participation
April 2024	InterACTIONS (Medical Physics Professionals)	Journal publication	<ul style="list-style-type: none"> Lifecycle Licence Outcomes
May 2024	C3 (CNSC/ Canadian Radiation Protection Association (CRPA)/Canadian Organization of Medical	Virtual meeting	<ul style="list-style-type: none"> Third Party Servicing and other contractors CRPA and COMP representatives

Date	Audience / Meeting attendees	Type of activity	Topics
	Physics(COMP) working group representatives		
May 2024	Industrial radiography licensees	In person meeting	<ul style="list-style-type: none"> • Reports on the status of action items. • Source retrieval case study
May 2024	DNSR licensees	Targeted Email	<ul style="list-style-type: none"> • Requirements if a licensed location must be evacuated (e.g. during a wildfire)
May 2024	RAMTrans 2024: 12th International Conference on Transport Storage and Disposal of Radioactive Materials attendees	In-person conference	<ul style="list-style-type: none"> • Presentation on the study related to the number of shipments of nuclear substances each year in Canada
June 2024	Canadian Radiation Protection Association (CRPA)	Annual in-person conference	<ul style="list-style-type: none"> • Participation in sessions including information on: <ul style="list-style-type: none"> ○ Radiation protection ○ New Transport Canada registration requirements ○ Presentation by the International Safeguards Division • Presentation on the study related to the number of shipments of nuclear substances each year in Canada • Presentation on the What We Heard Report on the proposed amendments to the Class II Nuclear Facilities and Prescribed Equipment Regulation • CNSC booth participation • Participation in the planning committee
June 2024	Canadian Organization of Medical Physicists members	In-person conference	<ul style="list-style-type: none"> • Two poster presentations: <ul style="list-style-type: none"> ○ Lifecycle licensing • What We Heard Report on the proposed amendments to the Class II Nuclear Facilities and Prescribed Equipment Regulation

Date	Audience / Meeting attendees	Type of activity	Topics
June 2024	World Nuclear Transport Institute Summer SAMM attendees	In-person meeting	<ul style="list-style-type: none"> Structure of the Packaging and Transport of Nuclear Substances Regulations, 2015 as related to International Atomic Energy Agency's (IAEA) SSR-6 – Regulations for the Safe Transport of Radioactive Material
July 2024	InterACTIONS (Medical Physics Professionals)	Journal publication	<ul style="list-style-type: none"> Transport or Not Transport
August 2024	DNSR licensees	Targeted email	<ul style="list-style-type: none"> Therapeutic use of nuclear substances – best practices
October 2024	Quebec Provincial Health Authorities	Outreach	<ul style="list-style-type: none"> Meetings to establish a plan for the transfer of licences and for managing future compliance challenges
October 2024	InterACTIONS (Medical Physics Professionals)	Journal publication	<ul style="list-style-type: none"> Comments received regarding amendments of Class II Nuclear Facilities and Prescribed Equipment Regulations
November 2024	DNSR licensees	Targeted email	<ul style="list-style-type: none"> Alpha emitters and skin contamination update
December 2024	CRPA/CNSC working group representatives	Virtual meeting	<ul style="list-style-type: none"> Regulatory updates Canadian Association of Medical Radiation Technologists (CAMRT) webinars ROR interventions Licence appendix documents
December 2024	CAMRT Webinars	Virtual – hosted by CAMRT	<ul style="list-style-type: none"> 2 distinct sessions <ul style="list-style-type: none"> General licensing and compliance information Establishing detection and contamination measurements
Throughout 2024 (total of 18 sessions)	New licensees (including radiation safety officers and applicant authorities)	Targeted virtual meeting	<ul style="list-style-type: none"> Joint effort between licensing and inspection staff to help educate new licensees on the various aspects of licensing and compliance, including:

Date	Audience / Meeting attendees	Type of activity	Topics
			Review of the issued licence <ul style="list-style-type: none"> • Relevant information/resources available on the CNSC website • Overview of the inspection process • Overview of the licensing process • Reporting requirements • Question and answer session
Throughout 2024 (12 issues)	DNSR licensees	DNSR Digest	<ul style="list-style-type: none"> • Message from the DG • Reminder that new REGDOC 2.5.6-<i>Design of Rooms Where Unsealed Nuclear Substances Are Used</i> is available • Thyroid Uptake System and Gamma Camera System Health Canada Recalls • World Nuclear University • DNSR Digest Survey • Comment period open for proposed amendments to the International Atomic Energy Agency's (IAEA) <i>SSR-6 – Regulations for the Safe Transport of Radioactive Material</i> • Import/Export Reminders: restrictions and customs • Updated inspection criteria • Discussion paper on proposed changes to the <i>Nuclear Substances and Radiation Devices Regulations</i> and the <i>Packaging and Transport of Nuclear Substances Regulations, 2015</i> • Why keeping accurate records is important (falsification of records) • Regulatory amendments and REGDOC amendments related to safeguards and export controls. • Extremity monitoring requirements

Date	Audience / Meeting attendees	Type of activity	Topics
			<ul style="list-style-type: none"> • Summary of events and reporting in 2023 • Reminder to report if required to evacuate due to a natural disaster • Criminal Records Name Check Reminder • New IAEA guidance document for academic and research institutions • Type A package requirements • What we heard report: Class II Nuclear Facilities and Prescribed Equipment Regulations • Personal protective equipment when handling unsealed sources • Action levels 101 • New President at the CNSC • ROR 2023 posted for comment • Transport Canada's Client Information Database-deadline to register approaching • IAEA Radiopharmacy Database • Contacting the CNSC reminder • Official languages poll • Emergency dose limits • Therapeutic nuclear medicine guidance • Spills Reporting • World Nuclear University registration reminder • Reminder regarding the official languages poll • Webinar on the Nuclear Non-proliferation Import and Export Control Regulations amendments

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Date	Audience / Meeting attendees	Type of activity	Topics
			<ul style="list-style-type: none"> Update to the Radionuclide Information Booklet and skin contamination guidelines Informing NEWs of their doses
2024	Members of the public	Webpage creation	<ul style="list-style-type: none"> Waste nuclear substance licence
Ongoing	Class II licensees	Grant contribution	<ul style="list-style-type: none"> Grant issued by the CNSC to the Canadian Organization of Medical Physicists to perform research related to accelerators and Class II facilities.

Appendix L: Status of issues, concerns and requests from intervenors

Five intervenors provided comments on the [Regulatory Oversight Report on the Use of Nuclear Substances in Canada: 2023](#). The tables below summarize their interventions and staff response to the interventions.

Table 30: Summary of areas of interest in the interventions

Area of interest	Number of comments and issues raised
Report format and contents and tracking of commitments	7
Outreach and engagement including CNSC website content	4
Environmental protection	4
Participant funding and stakeholder capacity funding	4
Reportable events	3
Availability of data	3
Inclusion of other SCAs in the ROR	3
Commission proceedings	3
Waste, decommissioning and financial guarantees	3
Trends in reporting (nuclear medicine)	2
Doses to workers	2
Regulatory framework	2
Emergency preparedness	1
External complaints process	1

United Nations Declaration on the Rights of Indigenous People	1
Modernized Combined Electrolysis and Catalytic Exchange facility	1
Total	44

Table 31: Summary of intervention dispositioning

Intervenors on the 2023 ROR	Total number of comments and issues raised	Notes
Radiation Safety Institute of Canada	6	All comments and issues responded to in writing. Offer extended to meet in person
Nuclear Transparency Project	11	All comments and issues responded to in writing. Offer extended to meet in person.
Canadian Radiation Protection Association	6	All comments and issues responded to in writing. Offer extended to meet in person.
Manitoba Métis Federation	7	All comments and issues responded to in writing. Offer extended to meet in person.
Kebaowek First Nation	14	All comments and issues responded to in writing. Offer extended to meet in person.

Appendix M: References

M1: 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)

M2: 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](#)

M3: International references

While not necessarily explicitly referenced, IAEA safety standards and guidance documents, are translated into regulatory requirements or licence conditions for licensees covered in the report. The following are some of the key IAEA documents that are applicable to licensed activities covered by this report.

- [IAEA Code of Conduct on the Safety and Security of Radioactive Sources](#)
- [IAEA Guidance on the Import and Export of Radioactive Sources](#)
- [IAEA Guidance on the Management of Disused Radioactive Sources](#)
- [IAEA SAFETY STANDARDS SERIES No. GSR Part 1-Government, Legal and Regulatory Framework for Safety](#)
- [IAEA SAFETY STANDARDS SERIES No. GSR PART 3 – Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards](#)
- [IAEA SAFETY STANDARDS SERIES No. SSR-6 – Regulations for the Safe Transport of Radioactive Material](#)
- [IAEA TS-G-1.4 – The Management System for the Safe Transport of Radioactive Material](#)
- [IAEA Safety Standards Series No. TS-G-1.5- Compliance Assurance for the Safe Transport of Radioactive Material](#)
- [IAEA SAFETY STANDARDS SERIES NO. SSG-26-Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material](#)

M4: Other relevant documents

- [RD-364: Joint Canada–United States Guide for Approval of Type B\(U\) and Fissile Material Transportation Packages](#)