



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

Canada

# MEDICAL SECTOR PERFORMANCE IN THE RADIATION PROTECTION SAFETY AND CONTROL AREA (SCA) IN 2023

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Presentation by staff

May 22, 2024

eDocs 7253276 (PPTX)

eDocs 7273520 (PDF)

- To present an update on medical sector data for 2023.
- Commission request following 2022 Regulatory Oversight Report on the Use of Nuclear Substances.



Injection of a radiopharmaceutical  
Photo courtesy of the Ottawa Hospital



# Presentation Outline

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Nuclear medicine and how we regulate it

Compliance results and actions taken

Conclusions

# NUCLEAR MEDICINE AND HOW WE REGULATE IT

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Bone scans courtesy of Radiology Associates of Venice and Englewood

- Approximately 350 licenses with 570 inspectable locations.
- Every location is unique:
  - Small, private clinics to large, amalgamated hospitals with multiple locations
  - 30+ different isotopes used

**Nuclear Medicine uses nuclear substances to diagnose and treat disease.**



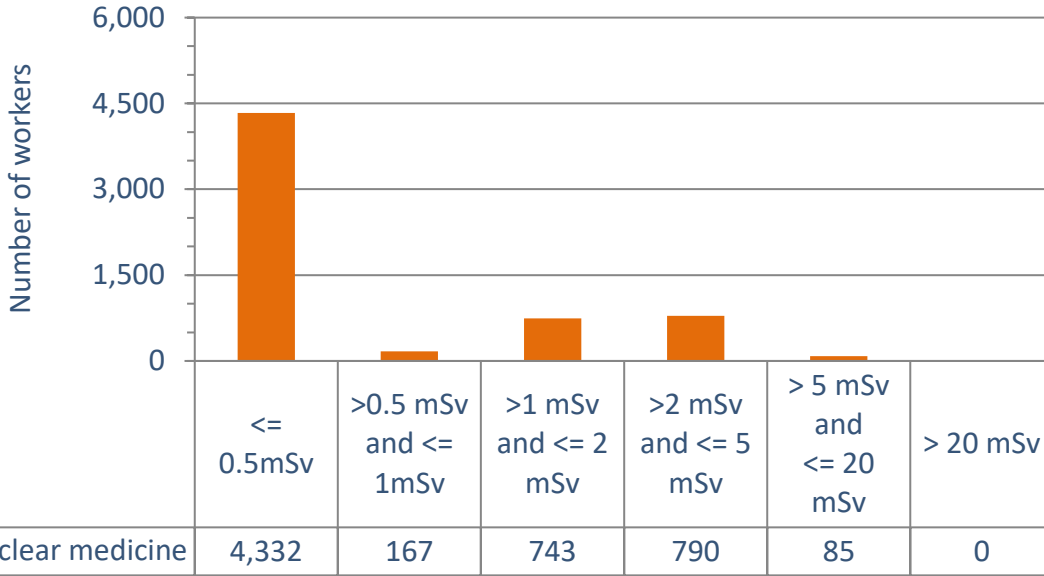
# Who is responsible for radiation safety?

- The licensee is accountable and responsible for radiation safety.
- Key positions include:
  - Applicant Authority (AA)
  - Radiation Safety Officer (RSO)

It is the applicant authority's responsibility to ensure that resources are present to conduct licensed activities safely.



# Nuclear Medicine is safe



Doses to workers in 2023

No overexposures.  
Effective dose limit for a Nuclear Energy Worker is 50 mSv/year.

No risk-significant events.

All notices of non-compliance have been corrected.



## **CNSC staff verify:**

Applicant has developed an adequate Radiation Protection Program and internal operating procedures.

- Detailed emergency procedures.
- Commitments to maintaining radiation doses as low as reasonably achievable (ALARA).
- Training and qualification procedures for workers.





# Compliance

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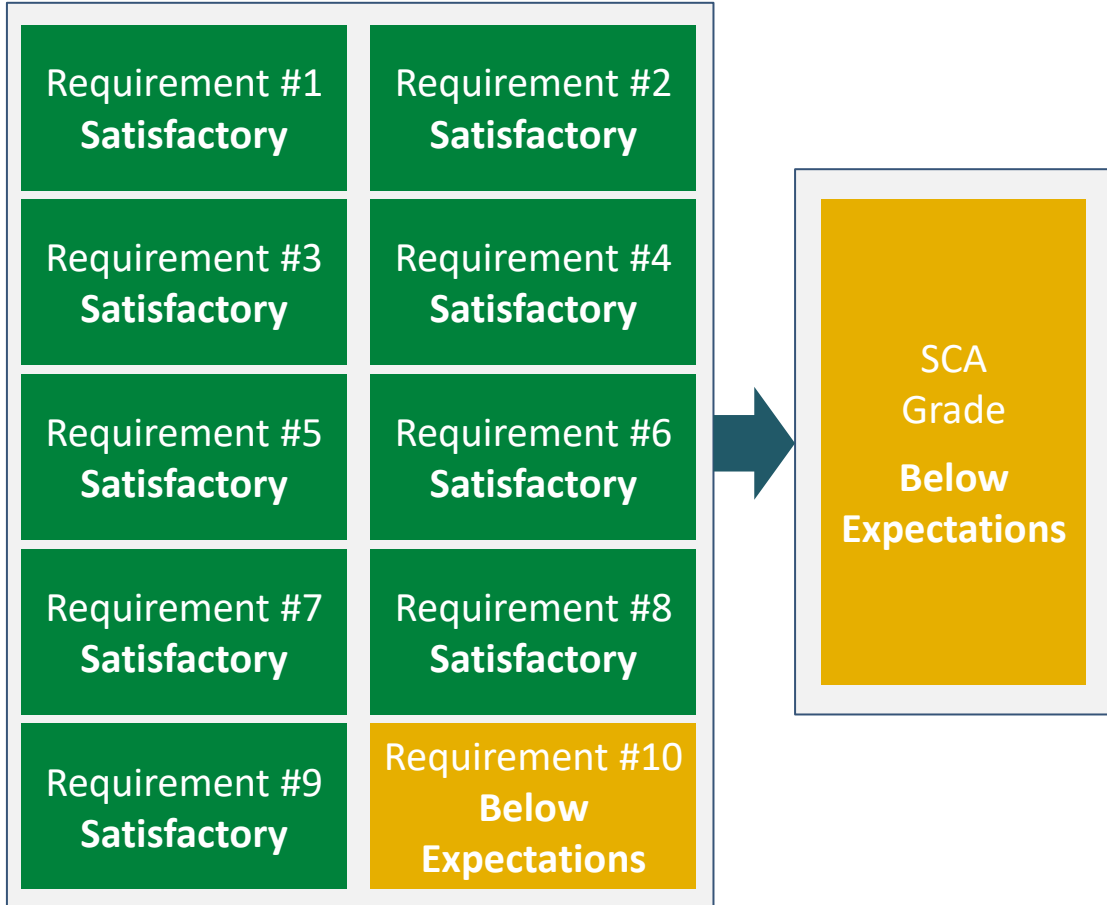
- The baseline inspection frequency for nuclear medicine – every 3 years.
- Inspectors use a standardized worksheet to verify requirements under each Safety and Control Area (SCA).
- Each requirement is assigned a risk-ranking.



# SCA grade calculation is conservative

In this example, the licensee is compliant with 90% of the individual requirements.

A single *Below Expectations* requirement can drop the overall SCA performance to *Below Expectations*.



# 2023 COMPLIANCE RESULTS

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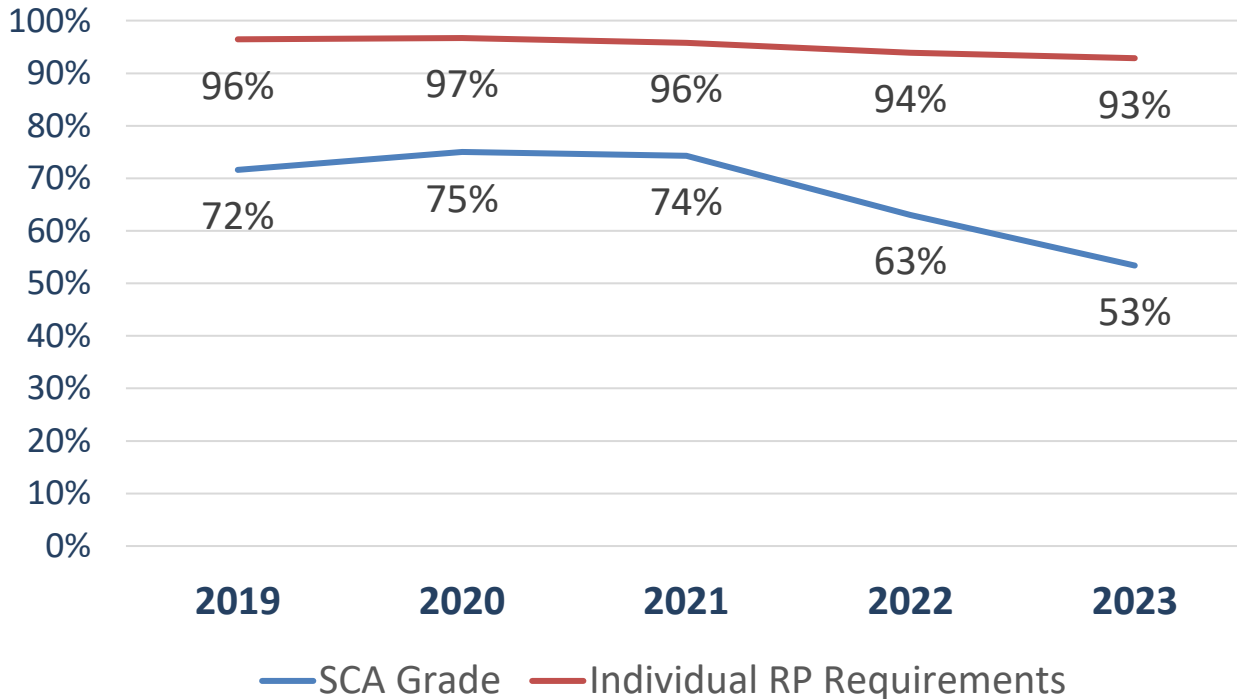
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# Radiation Protection (RP) SCA Results

## Satisfactory Inspection Ratings, 2019 to 2023



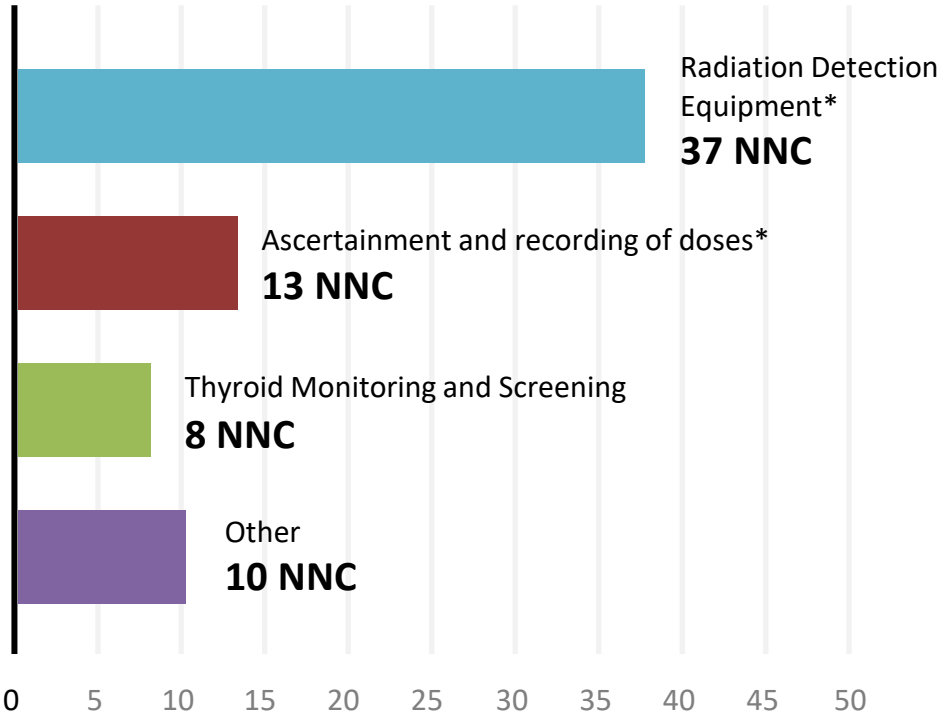
Compliance with individual RP requirements was 93% in 2023.

The overall RP SCA grade was 53%.



# Where are we seeing non-compliance?

## Notices of non-compliance (NNC) in the RP SCA



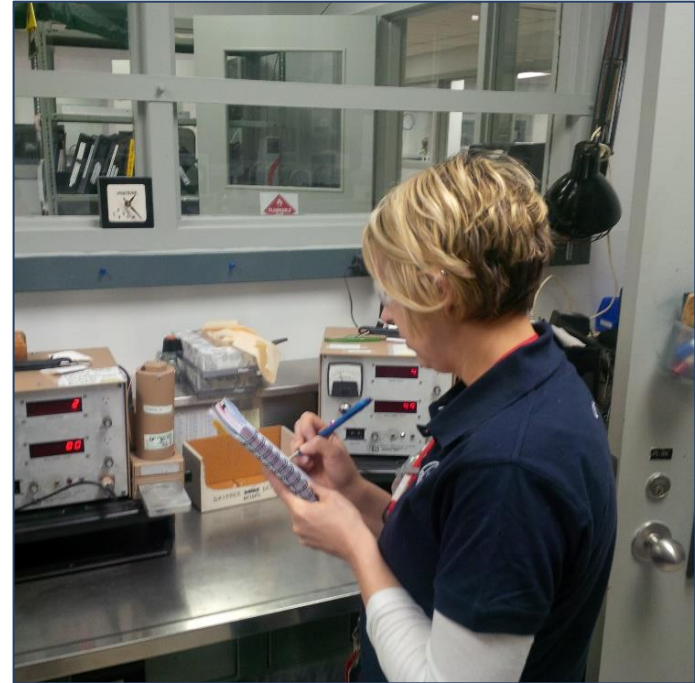
CNSC inspectors issued **68 NNC** in the RP SCA in 2023.

\*We are still seeing a strong impact following the publication of the revised *Radiation Protection Regulations (RPR)*.



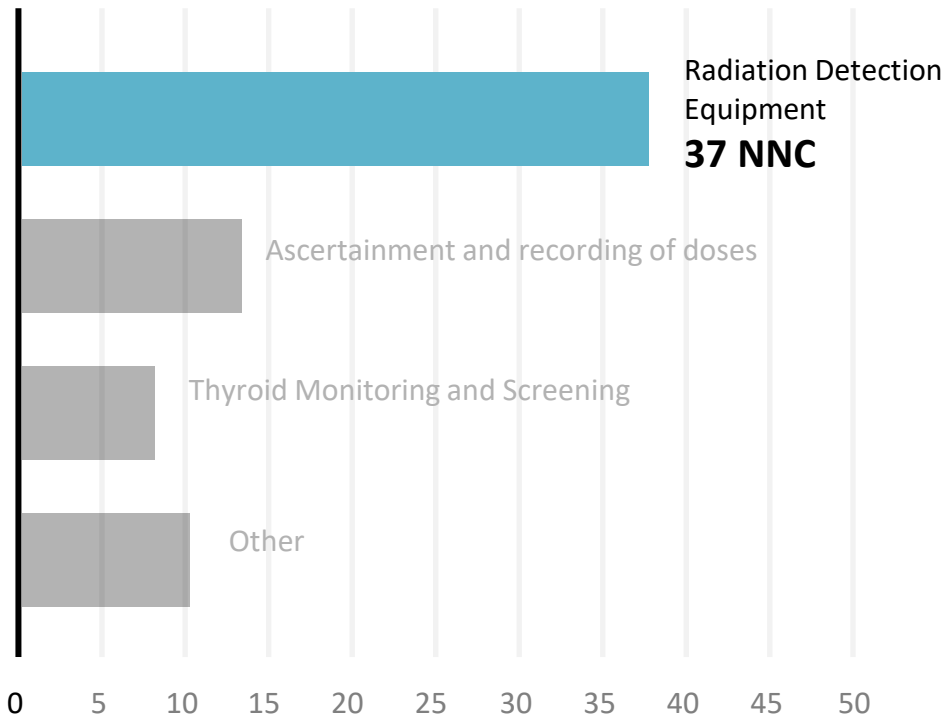
- Came into force late 2020.
- Focus on compliance promotion in 2021.
- Began citing against new requirements in 2022.

Certain changes impact those who use and handle unsealed nuclear substances more than other industries



CNSC staff performing an inspection.  
Source: CNSC

## Notices of non-compliance (NNC) in the RP SCA



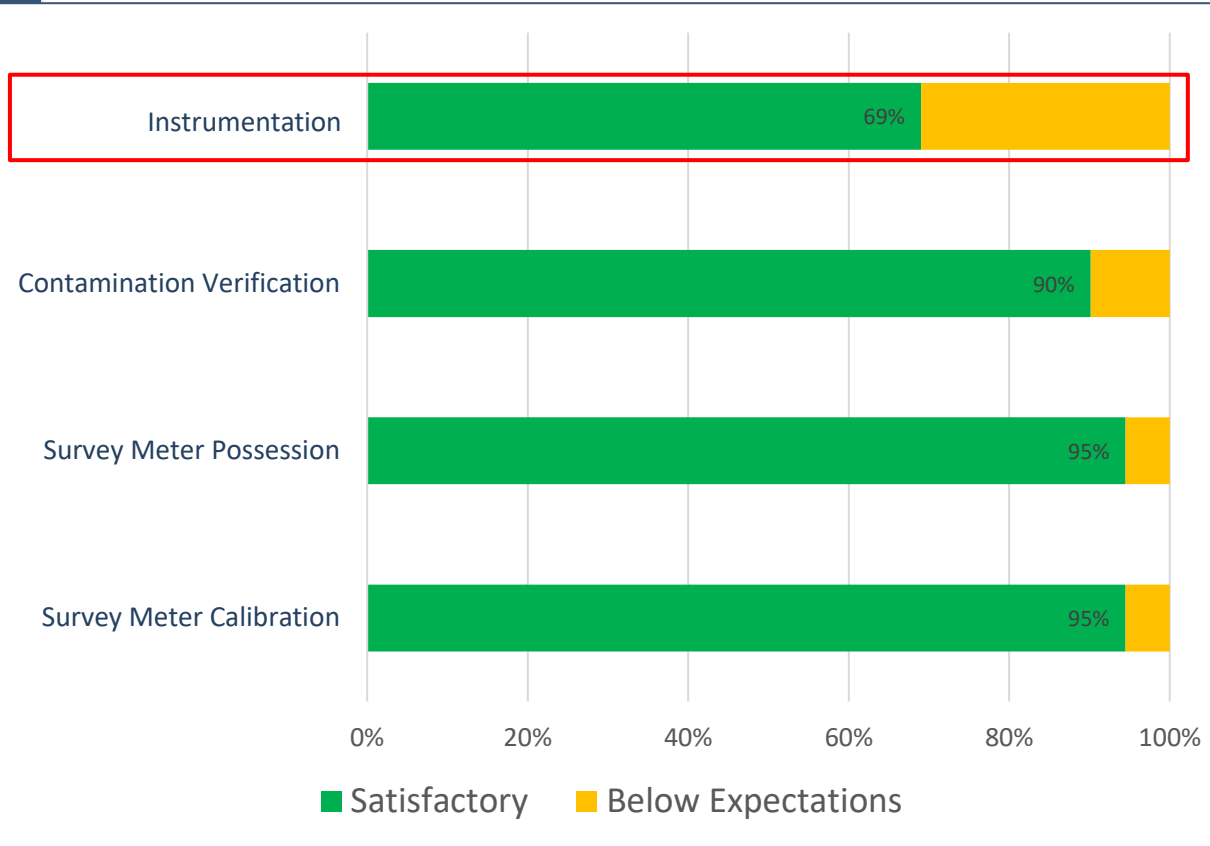
Over 50% of NNC were related to Radiation Detection Equipment.



Survey meter (left) and Contamination meter (right) Source: CNSC



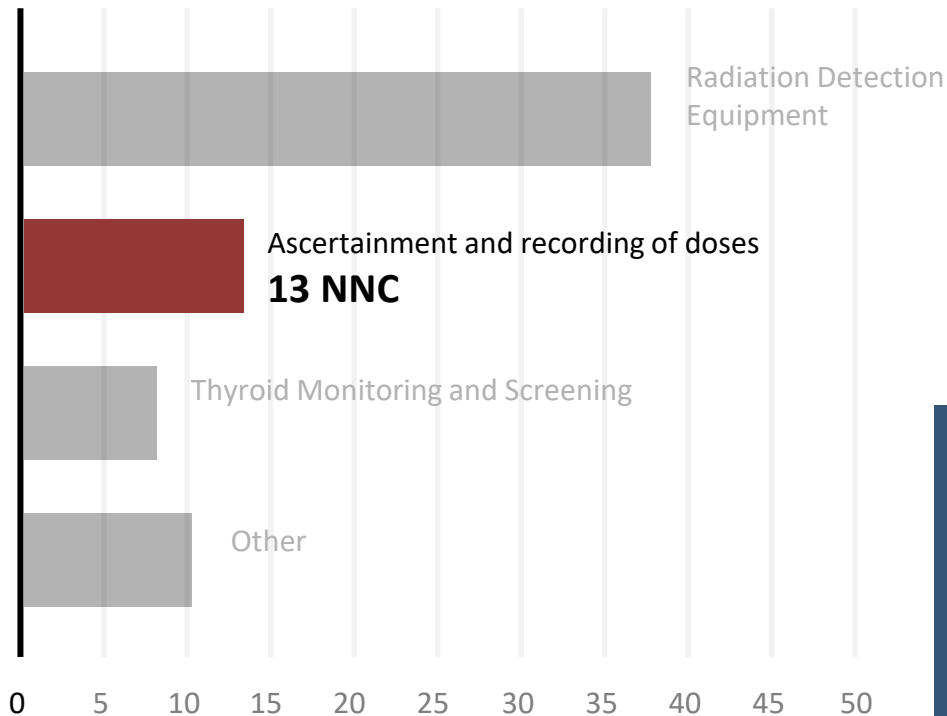
# Radiation Detection Equipment Requirements



**What changed?**

With the new section of the RPR on instrumentation, contamination detection equipment must be calibrated on an annual basis and calibration data must be available for inspection.



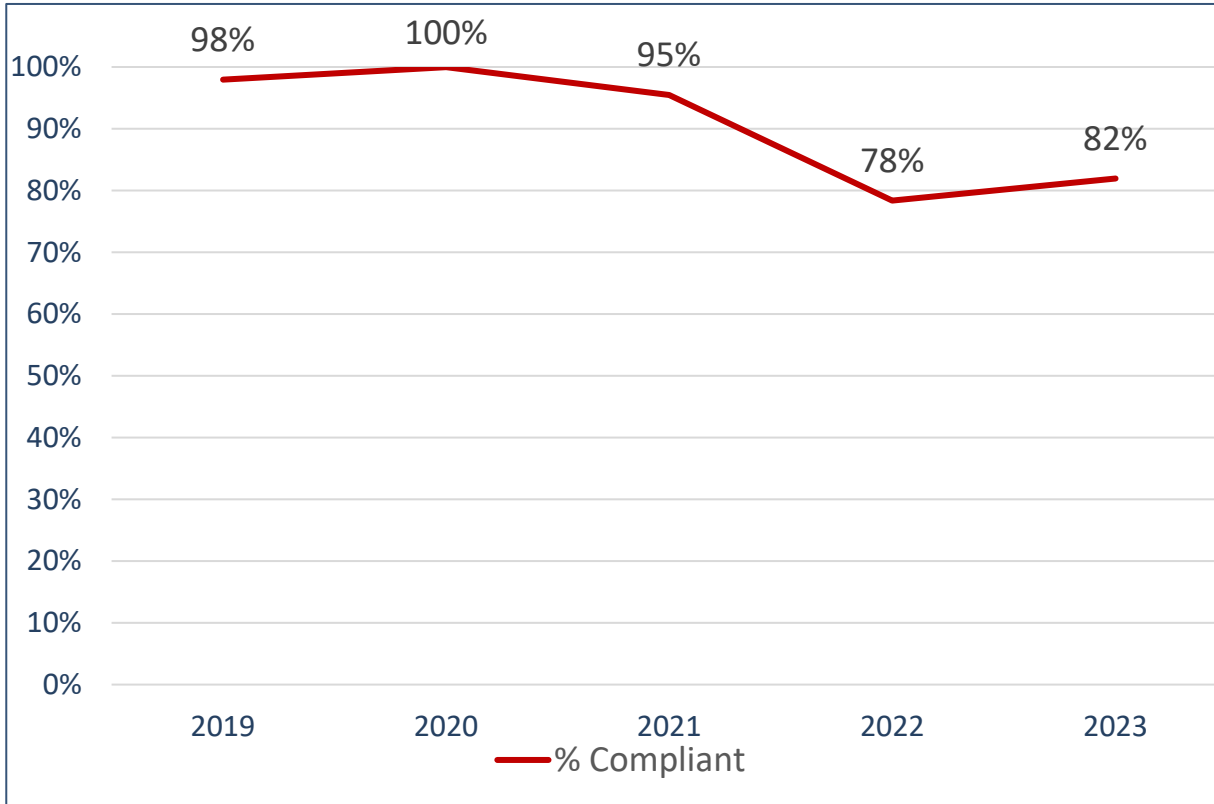


Whole body (left) and extremity dosimeter (right).  
Source: CNSC

Non-compliance was mostly related to extremity dosimetry.



# Ascertainment of Doses



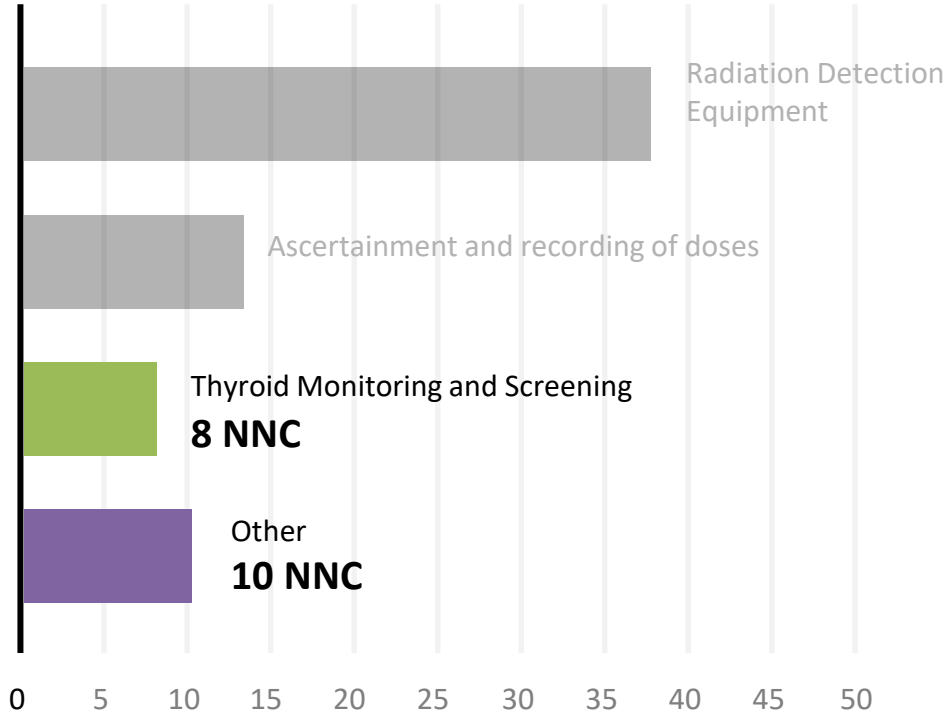
There have been no overexposures.

**What changed?**

If extremity dosimeters are **not worn**, licensees must now be able to show that extremity doses to workers are **below 50 mSv**.



# Non-Compliance - Other



Thyroid monitoring and screening was compliant in 90% of inspections in 2023.

Other NNC are not individually significant when discussing the trend in compliance performance.

# ACTIONS TAKEN BY THE CNSC

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## Evaluation of the Role of the RSO in the Medical and Academic/Research sectors in response to industry trends.

- Budget constraints and the important focus on patient care add an additional layer of complexity to the role of RSOs in the medical sector.
- Some RSOs face barriers due to lack of time/funding to attend learning events, and lack of management support.

## In response to this evaluation, CNSC staff :

- Developed REGDOC-1.6.2, *Radiation Protection Programs for Nuclear Substances and Radiation Devices Licences*.
- Published a Welcome Package for Applicant Authorities.
- Created the Nuclear Substances and Radiation Devices Mentorship Program.



- Published guidance.
  - REGDOC-2.7.1, *Radiation Protection*.
  - REGDOC-2.7.2, *Dosimetry*.
- DNSR Digest Articles.
- One on one meetings with new licensees.
- Targeted letters to Nuclear Medicine licensees.
  - Extremity dosimetry expectations and information on how to comply.
  - Below Satisfactory compliance performance with amended RPR regulations.
- Tools to help licensees with calibration calculations.

## Webinar

In July 2023, staff offered licensees a webinar on contamination meter calibration and how to comply with the amended regulations.

# CONCLUSIONS

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# Conclusions

- Changes to *Radiation Protection Regulations* continue to impact the SCA performance of this subsector.
  - Based on inspection frequency and licensing periods, we expect this to begin to improve in 2025.
  - Overall compliance with individual requirements remains high.
- Licensees are responsible for safe operations and compliance with regulatory requirements.
  - How licensees manage resources for their radiation protection programs has an impact on performance.
  - The CNSC provides guidance, verifies compliance and takes appropriate enforcement action as needed.

**The Nuclear Medicine Subsector remains safe and secure**



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