



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Canada

CNSC activities related to implementation of a new dose limit for the lens of the eye



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Canadian Nuclear Safety Commission (CNSC): Overview



- Regulates use of nuclear energy and materials to protect health, safety, security and the environment
- Implements Canada's international commitments on the peaceful use of nuclear energy
- Disseminates objective scientific, technical and regulatory information to the public



CNSC Regulated Facilities and Activities



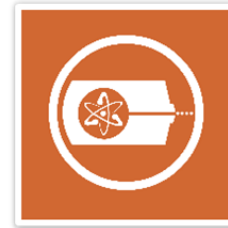
Uranium mines and mills



Uranium fuel fabrication and processing



Nuclear power plants



Nuclear substance processing



Industrial and medical applications



Nuclear research and educational activities



Transportation of nuclear substances



Nuclear security and safeguards



Import and export controls



Waste management facilities

Recent enhancements to CNSC's Radiation Protection Regulatory Framework



- CNSC amended the [Radiation Protection Regulations](#) (RPR), which included a reduction to the equivalent dose limit for the lens of an eye for a nuclear energy worker from 150 mSv to 50 mSv a one-year dosimetry period, effective January 1, 2021
- New CNSC guidance for licensees published in July 2021 on methods and techniques to ascertain occupational doses including for the lens of the eye
 - currently no defined regulatory requirements for dosimeters for lens of the eye
 - currently no approved lens of the eye dosimeters for CNSC licensees
 - research project initiated through Canada's Federal Nuclear Science and Technology network on eye lens dosimetry

CNSC Collaboration with Canada's Federal Nuclear Science and Technology Work Plan (FNST) (1)



- CNSC collaborates on Canada's Federal Nuclear Science and Technology research project on eye lens dosimetry
 - aim of project is to enhance scientific understanding in this area; resulting in new acceptance criteria and recommendations for eye-lens dose assessment methods for the various CNSC regulated activities
 - first phase of work was completed and published in the Journal of Radiological Protection: "*Current status of eye-lens dosimetry in Canada*"
<https://doi.org/10.1088/1361-6498/ac34a1>
 - the paper summarizes the current Canadian context with respect to the new equivalent dose limit for the lens of the eye by identifying implementation approaches, technological gaps and methods that may be used for ascertaining lens of eye doses

CNSC Collaboration with Canada's Federal Nuclear Science and Technology Work Plan (FNST) (2)



- Second phase of work is underway, addressing the following topics:
 - Real Time Dosimetry for the Lens of Eye:
To investigate the use of commercially available dose rate meters for their use as eye lens dose rate meters. The work is complete, and a manuscript was recently submitted for publication in the *Radiation Protection Dosimetry* journal.
 - Neutron Dosimetry for the Lens of Eye:
To review and validate/update neutron conversion coefficients for the lens of the eye. The work is complete, and a manuscript is being prepared for submission for publication in a peer-reviewed journal.
 - Photons and Electrons Passive Dosimetry for the Lens of Eye:
To determine thin and thick passive dosimeters' responses to mono-energetic photons and electrons at different angle of incidences through Monte Carlo simulations. The effect of the variability in eye dimensions on the eye-lens dose response is also investigated.

Next Steps and CNSC Priorities



- CNSC is currently developing regulatory expectations for licensing of dosimetry services for lens of the eye, informed by work under FNST:
 - determine criteria for the accuracy and precision specifications and uncertainty limits for personal dose equivalent $H_p(3)$
 - in parallel, perform independent testing of a sample of commercially available eye-lens passive dosimeters
 - develop regulatory expectations for performance testing limits for $H_p(3)$
 - licence commercially available eye-lens dosimeters for use by Canadian licensees



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Questions and Discussion

Thank You!