



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Canada

Building a Dynamic Technical Glossary – With a Dash of Rocket Science

Marsha Fine, CNSC Writer/Editor

Jane Hunt, CNSC Regulatory Project Officer

Editors Canada Annual Conference 2018

Saskatoon, SK



Overview

- Context – How and why the CNSC glossary was started
- Our team of technical experts and how we built bridges
- Challenges and solutions
- What's next



CNSC Mission

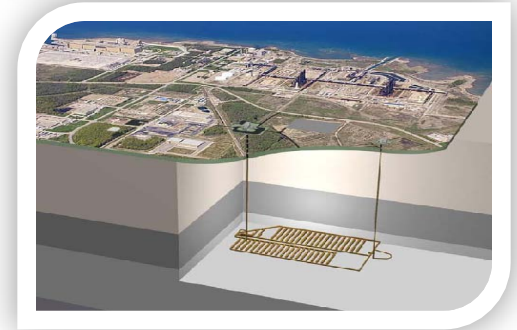
Regulate the use of nuclear energy and materials

- to protect *health, safety, security* and the *environment*
- to implement Canada's *international commitments* on the peaceful use of nuclear energy
- to disseminate *objective scientific, technical* and *regulatory information* to the public

Canada's nuclear regulator

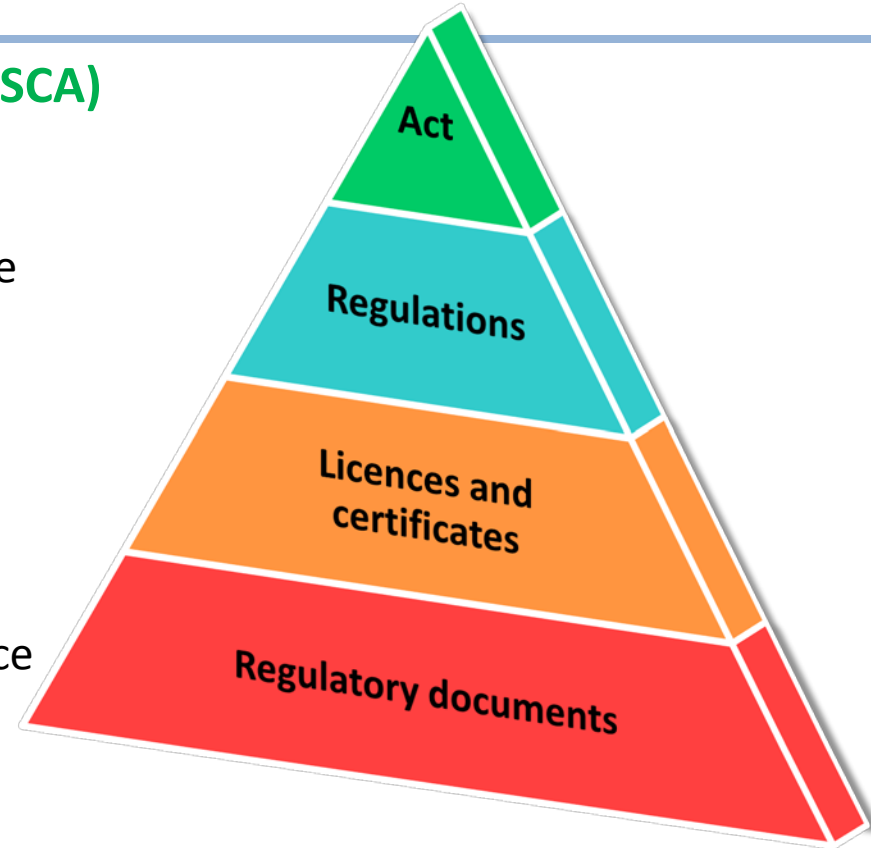
CNSC Regulates All Nuclear-Related **Facilities** and **Activities** in Canada

- **Uranium mines and mills**
- Uranium fuel fabrication and processing
- Nuclear power plants
- Nuclear substance processing
- Industrial and medical applications
- Nuclear research and educational
- Export/import control
- Waste management facilities

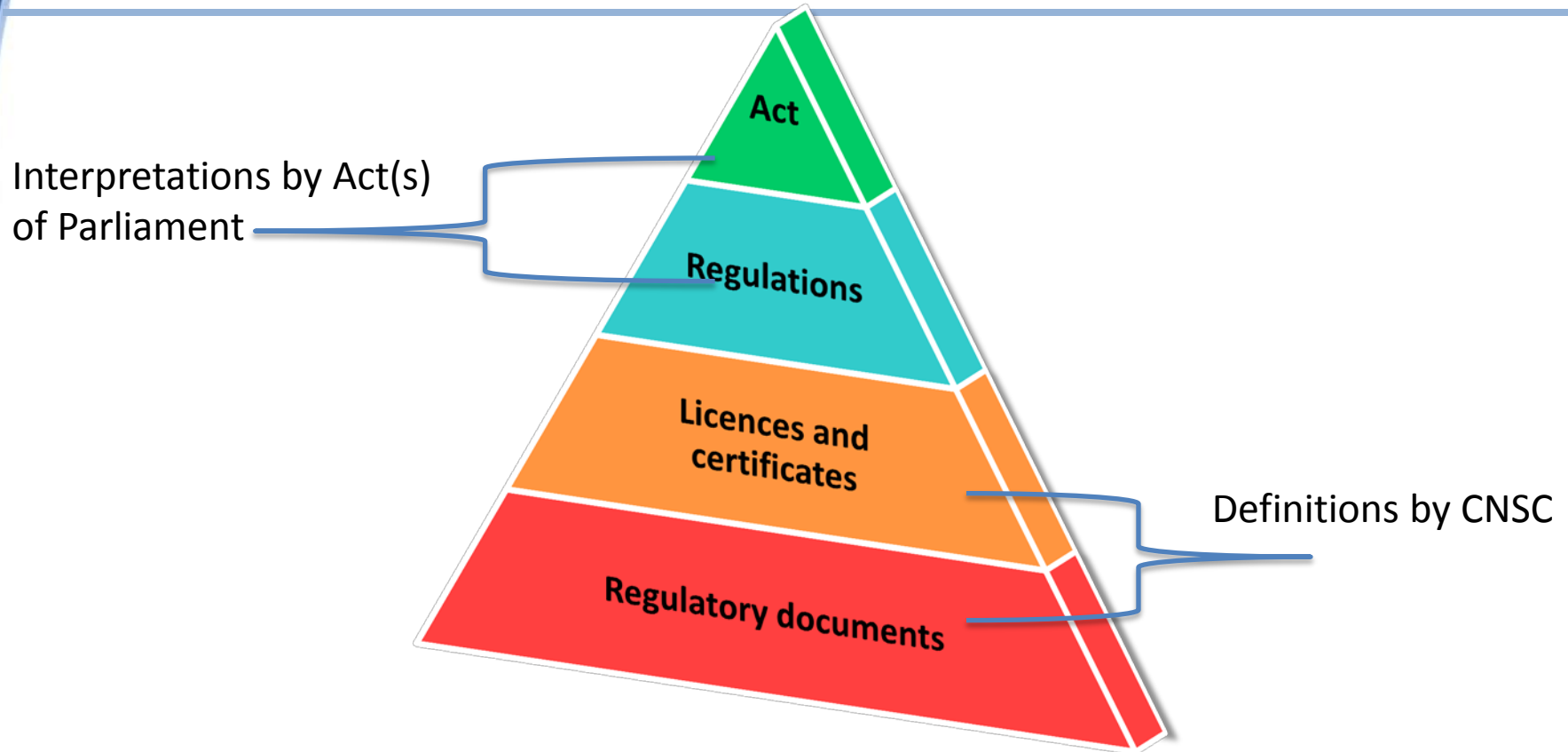


Regulatory Framework

- **Nuclear Safety and Control Act (NSCA)**
 - enabling legislation
- **Regulations**
 - high-level and generally applicable requirements
- **Licences, licence conditions handbooks, certificates**
 - facility- and/or activity-specific requirements
- **Regulatory documents**
 - include requirements and guidance
 - **REGDOC-3.6, Glossary of CNSC Terminology**



Who Defines What Terms?



CNSC Regulatory Document Framework

1.0 Regulated facilities and activities

- Series 1.1 Reactor facilities
- 1.2 Class IB facilities
- 1.3 Uranium mines and mills
- 1.4 Class II facilities
- 1.5 Certification of prescribed equipment
- 1.6 Nuclear substances and radiation devices

2.0 Safety and control areas

- Series 2.1 Management system
- 2.2 Human performance management
- 2.3 Operating performance
- 2.4 Safety analysis
- 2.5 Physical design
- 2.6 Fitness for service
- 2.7 Radiation protection
- 2.8 Conventional health and safety

- 2.9 Environmental protection
- 2.10 Emergency management and fire protection
- 2.11 Waste management
- 2.12 Security
- 2.13 Safeguards and non-proliferation
- 2.14 Packaging and transport

3.0 Other regulatory areas

- Series 3.1 Reporting requirements
- 3.2 Public and Aboriginal engagement
- 3.3 Financial guarantees
- 3.4 Commission proceedings
- 3.5 CNSC processes and practices

3.6 Glossary of CNSC terminology

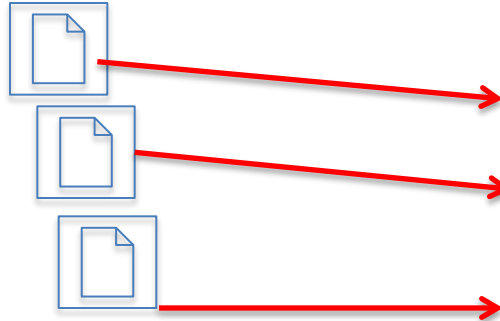
Terms and definitions from all these sectors and safety topics feed into the new glossary

CNSC Regulatory Document Framework

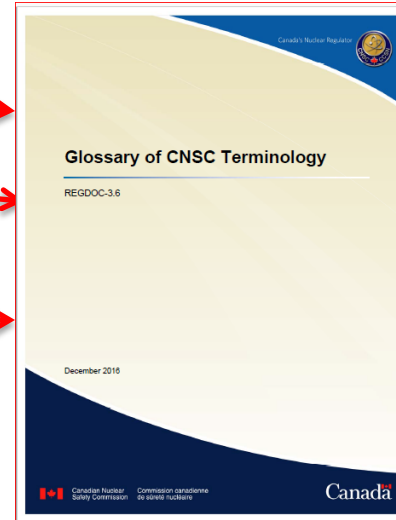
1.0 Regulated facilities and activities

Series 1.1 Reactor facilities

- REGDOC-1.1.1
- REGDOC-1.1.2
- REGDOC-1.1.3



Terms and definitions from all these sectors and safety topics feed into the new glossary



Why Have a Single Glossary?

- Almost every regulatory document contained a glossary of relevant terms and definitions
- But there were differences across these definitions
 - ✓ different contexts, mostly because one size does not fit all
 - ✗ time spent reinventing the wheel
 - ✗ differences in writing style
- A standard, **evergreen**, organization-wide glossary **increasingly** seen as an essential communications tool to resolve differences
 - saves time, by providing standard definitions for commonly used terms
 - promotes consistency among documents

What would it take to get it going?

Many Ways to Initiate a Glossary

- Suggestions/authorization for a new tool can come from anywhere – you, your boss/client
- In our case, the Commission asked CNSC staff to prepare a corporate glossary
- Commission:
 - group of independent individuals, authorized by the *Nuclear Safety and Control Act*, who make decisions on matters such as licensing nuclear power plants or uranium mines
 - hears from licensees (or companies applying for licences), CNSC staff experts and the public

Long Story Short

- In March 2014, the Commission made their request
- We presented our draft to them and they liked it
- Management approved it and the glossary was posted in 2016 and available to the public in HTML and PDF formats
 - thoroughly reviewed “one-stop shopping” source with standard terms and definitions
 - terms and definitions specific to the CNSC and its regulatory role
 - consistent terminology and **consistently edited!**
 - **not a requirement** – does not replace the Act, regulations, licences, etc.
 - CNSC processes allow regular updates to keep it **evergreen**

OK, But How Did We Get There?



We built bridges with our community!

First – What Would It Look Like?

- What definitions to include?
 - ✓ regulatory documents – Commission was addressing an issue that it saw specifically in that set of documents
 - ✓ Act and regulations made under the Act – to make sure staff consulted interpretations before writing new definitions
 - ✓ other material, such as annual reports
 - ✓ limited material from other acts and organizations such as CSA Group
- What **not** to include?
 - ✗ definitions from CNSC scientific and technical papers: so many!
 - ✗ draft definitions
 - ✗ (most) ordinary dictionary definitions

December 2016

REGDOC-3.6, Glossary of CNSC Terminology

analytical decision level (*niveau de décision analytique [niveau critique]*)

The amount of a count or final instrument measurement of a quantity of analyte at or above which a decision is made that a positive quantity of the analyte is present (measured in becquerels per litre).

annual limit on intake (ALI) (*limite annuelle d'incorporation [LAI]*)

The activity, in becquerels, of a radionuclide that will deliver an effective dose of 20 mSv during the 50-year period after the radionuclide is taken into the body of a person 18 years old or older or during the period beginning at intake and ending at age 70 after it is taken into the body of a person less than 18 years old. (Source: *Radiation Protection Regulations*)

ANO (*ONA*)

authorized nuclear operator; see [reactor operator](#)

ANS (*ANS*)

American Nuclear Society

ANSI (*ANSI*)

American Nuclear Standards Institute

anticipated operational occurrence (AOO) (*incident de fonctionnement prévu [IFP]*)

An operational process deviating from normal operation that is expected to occur at least once during the operating lifetime of a reactor facility but, because of appropriate design provisions, does not cause any significant damage to items important to safety or lead to accident conditions. AOO is a plant state. Some examples of AOO are loss of normal electrical power and faults such as a turbine trip, malfunction of individual items of a normally running plant, failure of individual items of control equipment to function, and loss of power to the main coolant pump.

AOO (*IFP*)

See [anticipated operational occurrence](#).

applicant (*demandeur*)

An organization or person that has applied to the CNSC for a licence or for certification. For example, an applicant that applies for a licence to construct a nuclear facility has the overall responsibility, and controlling and coordinating authority, for overseeing the safe and satisfactory completion of all design, procurement, manufacturing, construction and commissioning work.

OR:

Any person applying for a site access security clearance (SASC) to a high-security site in Canada. Note: CNSC staff who are not inspectors and/or do not hold a Level II Secret Government of Canada clearance will apply for a CNSC SASC to work at the licensed facility.

applicant authority (*responsable de la demande*)

A position within an applicant's organizational structure with power to direct the application of financial and human resources.

areal density (*densité surfacique*)

The product of the thickness of a uniform slab and the density of fissionable material within the slab; hence, areal density is the mass of fissionable material per unit area of slab. Note: For non-uniform slabs, the areal density limits are valid for a horizontal slab subject to gravitational settling, provided the restrictions for uniform slabs are met throughout.

Starting New Draft Glossary – Team Leads

borescope (*endoscope*)

An inspection tool with a rigid or flexible optical tube designed for insertion into bores and cavities. The borescope consists of a lens positioned in front of a long tube containing image and illumination relays.

- Review existing terms/definitions
 - just team leads – **project officer/technical communicator and English editor** – involved at this point
 - reviewed existing, informal compilation of definitions from both published and draft material
- Put all suggested material into a draft
 - use normal regulatory document template as our tool which would generate a PDF and source the HTML versions
 - include
 - definitions from the informal glossary
 - interpretations from Act and regulations
 - do initial cleanup of definitions that differed slightly from each other
 - remove out-of-scope definitions

Team of Experts – Key to Success (1)

- Invite staff members to form a cross-functional glossary team
 - represent all aspects of the CNSC regulatory work – nuclear medicine, nuclear power plants, packaging and transportation, industrial radiography ... and yes – nuclear physicists are part of the team!
 - keen to participate
- Team to meet regularly and discuss around the table
 - scientific and technical experts debate content to come to consensus or identify concerns
 - team leads provide their expertise in their fields
- Team leads keep meetings on track!
 - debates could get off track!
 - team leads and experts work together to fine-tune definitions for context
 - team reviews section of draft and sends in comments before meeting

Team of Experts – Key to Success (2)

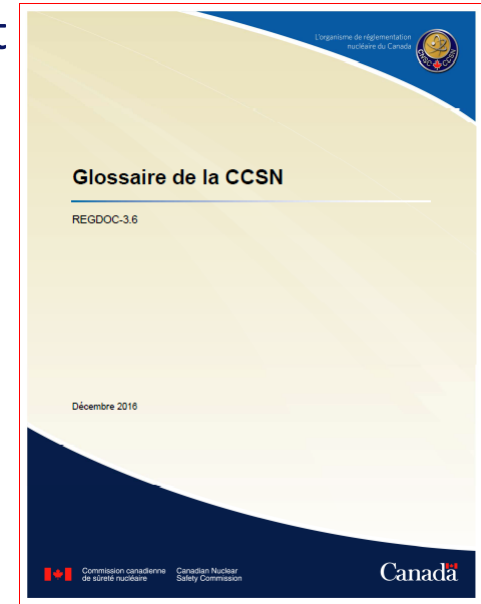
- Team leads update glossary based on results
 - multiple variations of definitions consolidated
 - consistent editing principles and phrasing applied, aligned with the CNSC's general writing style guide
 - when necessary, specific contexts were applied or act/regulation source identified

dosimetry service (*services de dosimétrie*)

A prescribed facility for the measurement and monitoring of doses of radiation. (Source: [Nuclear Safety and Control Act](#))

Team of Experts – Key to Success (3)

- CNSC is a federal agency; public documents must be **available in English and French**
- Scientific and technical team members included experts working in their field in French
- Glossary team member on the French translation/editing side was/is fully involved
- French had similar challenges as English **plus** others because of how some terms are used in French



Finalizing the Glossary

- Team of experts (including English editors and French translators/editors!) complete the draft – now what?
- Internal review and approvals
 - CNSC staff outside the team review the glossary
 - we go before the Commission to let them know that we completed the work as requested
 - approval received from appropriate management level
- More edits based on feedback from staff and Commission
- Posted on website
 - <http://www.nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/published/html/regdoc3-6/index.cfm>

Anatomy of a Typical Glossary Entry

- ② ③
- ① **postulated initiating event** (PIE) (*événement initiateur hypothétique [EIH]*)
- ④ An event identified in a design as leading to either an anticipated operational occurrence or accident conditions. ⑤ **Note:** Not necessarily an accident itself, a PIE is the event that initiates a sequence that may lead to an operational occurrence, a design-basis accident, or a beyond-design-basis accident, depending on the additional failures that occur. See also [initiating event](#). ⑥

- 1. Term
- 2. Acronym
- 3. French term and acronym
- 4. Definition
- 5. Note
- 6. Cross-ref

New Challenge 1: Retrieve Context

trending (~~établissement des tendances~~)

~~With respect to nuclear criticality safety,~~ the extrapolation of data from periodic non-destructive measurements of a control Raschig ring's physical and chemical properties, and from certain properties of the vessel, to predict changes with time in the properties measured.

- How to get back context after removing the term/def from original context?
- Solution: “with respect to” statements

New Challenge 2: Two Definitions

participant (*participant*)

A party or intervenor. (Source: *Canadian Nuclear Safety Commission Rules of Procedure*)

OR

An individual who is taking part in an emergency drill or exercise and responding to the simulated events.

- Within the regulatory world, the same term is used two or more different ways
- Solution: OR – a neat two-letter word to distinguish between definitions

New Challenge 3: Info Gaps

management system (*système de gestion*)

[With respect to packaging and transport of nuclear substances, h]as the same meaning as in the IAEA Regulations. (Source: [*Packaging and Transport of Nuclear Substances Regulations, 2015*](#))

Note: In the IAEA Regulations, a management system means a set of interrelated or interacting elements (system) for establishing policies and objectives and enabling the objectives to be achieved in an efficient and effective manner.

OR

The framework of processes, procedures and practices used to ensure that an organization can fulfill all tasks required to achieve its objectives safely and consistently. **Note:** The management system integrates all elements of an organization into one coherent system to enable all of the organization's objectives to be achieved. These elements include the structure, resources and processes. Personnel, equipment and organizational culture, as well as the documented policies and processes, are parts of the management system.

- More info is most commonly needed when a definition can't be changed for legal reasons and/or more description would simply be more useful
- Solution: Add notes

Caution: If citing another source, you need to stay on top of when that source changes

New Challenge 3: More Info Gaps

moderator control engineered barrier (*barrière artificielle de contrôle du modérateur*)

A physical feature of a system specifically identified and used to limit or control the introduction of moderators for nuclear criticality safety. Some examples of typical moderator control engineered barriers are secondary roofs, false ceilings, secondary walls, vapour barriers, raised floors or structure, normally closed apertures, and seals.

- Audience was more specialized but now it's broader – definition may still be too technical
- Solution: Add examples in notes or otherwise separated (like the list here) for readability

New Challenge 4 : Many Contexts

containment (*confinement*)

A method or physical structure designed to prevent or control the release of nuclear or hazardous substances. Some examples are:

- for waste management: a barrier system that controls releases to the environment through different chemical and physical applications
- for packaging and transport of nuclear substances: a package or a sealed source containing nuclear substances
- for reactor facilities: see [containment structure](#)

OR

The exercise of force that is sufficient to isolate, contain and/or stop an adversary in order to prevent the theft of nuclear material or sabotage to a vital area until the offsite response force can make an effective intervention.

- This definition shows a combination of
 - recontextualizing – “for”
 - OR
 - examples

New Challenge 5: Cross-references (1)

Fussell-Vesely (FV) importance (*mesure d'importance de Fussell-Vesely [FV]*)

See [importance measures](#).

importance measures (*mesures d'importance*)

With respect to probabilistic safety assessments (PSAs), indices on the importance of an event or group of events, comprising:

- **Fussell-Vesely importance:** for a specific basic event, the fractional contribution to PSA results for all accident sequences containing that basic event
- **risk increase ratio (RIR)**, also called **risk achievement worth (RAW)**: the factor by which the PSA results would increase if the basic event is assumed to happen with certainty (failure probability = 1.0)
- **risk decrease ratio (RDR)**, also called **risk reduction worth (RRW)**: the amount of reduction in the PSA results to be gained if the basic event is assumed to be available (failure probability = 0.0)

New Challenge 5: Cross-references (2)

used fuel pool (*piscine de combustible usé*)

See [wet storage bay](#).

wet storage bay (*piscine de stockage*)

A large pool of water where radioactive material (mainly fuel discharged from a nuclear reactor) is cooled and shielded until it is safe to remove to dry storage. Also called [fuel bay](#); irradiated fuel bay; spent fuel bay; storage bay; storage pool; [used fuel pool](#).

What's Next

- Keeping it evergreen
- Next update – available soon!
 - additional terms and definitions from regulatory documents published since first posting
 - a few changes to existing definitions
 - still meet with team of experts, but we're more efficient
- Future updates
 - may also include definitions from other sources, such as staff suggestions – Commission encouraged us to include more

CNSC Glossary and the World

- Vienna – INTERP meeting March 2018
 - “Consultants Meeting on the International Nuclear Terminology Repository Platform (INTERP)”
 - CNSC was invited by the International Atomic Energy Agency (IAEA)



- INTERP and other glossaries

[INTERP HOME](#)[INTERP Members' Benefits](#)[INTERP Search](#)[INTERP Members' Area](#)

INTERP Search

Currently the following glossaries are available:

[Glossary 1](#)[Glossary of CNSC Terminology](#)[Glossary 2](#)[Glossary 3](#)[Glossary 4](#)[Glossary 5](#)[Glossary 6](#)



A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

[INTERP HOME](#) [Glossary of CNSC Terminology](#)

EN

HTML

beta particle

Definition

A charged particle that is emitted from the nucleus of a radioactive element during radioactive decay of an unstable atom. Large amounts of beta radiation may cause skin burns, and beta emitters are harmful if they enter the body. Beta particles may be stopped by thin sheets of metal or plastic.

Definitions from other Glossaries

[Glossary 2](#)

Electron with positive or negative...

[Glossary 6](#)

During radioactive decay... |

- Easily see multiple definitions of any term

Conclusions

- **Possible** for an editor and/or technical writer to take on building a scientific or technical glossary, even if they don't have full expertise in the specific subject
- **Team of subject experts** – having the right people at the table to sort out terminology issues is key
- Editors and other technical communicators are experts in their own right who belong at that table – **language skills are critical** and this expertise needs to feed into the debate
- Challenges in building each definition are similar and so are solutions – **stretch your creativity!**



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Canada



Thank You! Questions?

nuclearsafety.gc.ca