

## Strengthening the security on transport of nuclear and other radioactive material: challenges and actions for regulatory improvements in Brazil

This work describes actions carried out by CNEN (Brazilian National Nuclear Energy Commission, the national regulatory body) to improve Brazilian nuclear and radioactive material transport security regulations, in a context of a broad revision and updating process of the country's regulatory framework regarding the subject. The new regulations aim to reflect the most recent international recommendations and guidelines, taking into account the peculiarities of each sector. Such revisions were deemed necessary due to changes in local and global threat scenario, the technology advances on detection/ tracking systems and the fact that the local regulation in force (CNEN NE-2.01) hadn't had major changes since 1981. CNEN NE-2.01 is applicable to the operational units whose activities relate to production, use, processing, handling, transport or storage of nuclear materials. It is being divided in three other documents, more specific and better targeted:

- CNEN-NN-2.01 "Security of Nuclear Material and Nuclear Facilities";
- CNEN-NN-2.05 "Security of Nuclear and Radioactive Material in Transport"; and
- CNEN-NN-2.06 "Security of Radioactive Sources and Associated Facilities".

In order to justify and accomplish such task, an extensive study of local and international documentation has been undertaken, which led to several conclusions that serve as basis on the elaboration of new regulations. Specifically for transport, CNEN-NN-2.05 was based on several IAEA Nuclear Security Series publications such as:

- NSS26-G "Security of Nuclear Material in Transport",
- NSS-9 "Security in the Transport of Radioactive Material",
- NSS29-G "Developing Regulations and Associated Administrative Measures for Nuclear Security",
- the Amendment to CPPNM and
- "Code of Conduct on the Safety and Security of Radioactive Sources".

The most important conclusions and challenges identified during the elaboration of CNEN-NN-2.05 compose the results of this work, which include:

- Different levels of security (in terms of detection/tracking, delay and response) depending not only on the category of nuclear material, or radioactive sources in transport, but also on the practice involved;
- State-based evaluation of the threat, in more precise quantitative terms (design basis threat);
- Development/use of newer methodologies for vulnerability assessments (e.g. response times, alarm assessment times, simulation metrics and tools, tabletop exercises, force-on-force exercises, scenario analyses, neutralization data);
- Improving interaction and communication amidst different State and private stakeholders, such as intelligence agencies, consignors, carriers and consignees;
- Training and formation of stakeholders in order to maintain a well-established nuclear security culture;
- Multi-agency exercises to improve mutual interaction and capabilities.

From the results obtained from the study, it's possible to conclude that the new local transport security regulation will reflect better international security good practices and provide more adequate requirements for design and evaluation of Physical Protection Systems on transport operations.

### State

Brazil

### Gender

Male

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