## Scenario 6-R: Prisoner stealing lamp bulbs

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| **Scenario 6-R: Prisoner stealing lamp bulbs** | |
| **Complexity of the scenario: easy** | |
| **Possible application of the scenario: Topics 4.1, 5.1, 5.2, 5.6 and 6.1** | |
| **Scenario description:** | |
| During a cell inspection, a prisoner who shared his cell with another inmate was discovered to have stolen 10 tritium tubes from tritium exit signs and was using them as night lights in his cell.  When discovered, the prisoner broke one of the tubes against the wall and threatened the two guards who performed the inspection with the broken glass tube. The guards immediately retreated and locked the cell door, leaving the prisoner in the cell with his cell mate.  The prisoner was unaware of the radioactive nature of the tritium tubes.  The guards informed the prison warden of the situation, and he alerted the emergency services.  After some minutes, when the prisoner calmed down and first responders arrived, both he and his cell mate were moved outside, and the cell was aerated.  **GettyImages-480937346Things to consider:**  This type of exit signs contains tritium gas, a naturally occurring radioactive isotope of hydrogen. Tritium is often used in exit signs to create a visible light without batteries or electricity. Tritium exit signs will glow without electricity or batteries for more than 10 years. They are useful because they do not require a traditional power source such as batteries or hardwired electricity.  Normally, a working, unbroken, tritium exit sign does not emit radiation. However, if a tritium exit sign is damaged, the tritium could be released. In such an event, the best things to do is leave the room immediately.  It is worth noting that it is not easy to break a tritium tube as it requires a certain effort.  Tritium emits β particles. If the lamp gas is inhaled or swallowed, the β particles emitted by the gas are most harmful as they can cause internal contamination. Tritium does not deposit on surfaces.  The risk connected to the tritium lamp bulbs is that tritium gas is lighter than air and, therefore, when the glass tube containing it breaks, the gas moves upwards and can be inhaled. The prisoner could be at risk of internal contamination caused by β radiation because when he broke the light bulbs he might have inhaled or swallowed tritium gas as he was unaware of its radioactive nature and did not take any precaution.  The trainer should inform the trainees that conventional triage methodology is applied in this scenario. However, when the number of victims is low, such as in this case, FRs would treat each victim immediately without a real need for triage. Therefore, conventional triage is part of this scenario discussion for the sole purpose of exercising and reviewing triage methodologies.  Decontamination is not needed as ventilation of the exposed subjects, i.e. moving them to an outside air location, and ventilation of the cell are the only useful things that can be done in this situation. Although, according to radiation protection law, the received dose from such an event cannot be discarded as irrelevant, the exposure itself normally does not pose a serious health risk.  This scenario may also be used to consider the ethical aspects of dealing with a potentially contaminated person who suddenly becomes violent or dangerous towards him/herself of the others, especially in the presence of a cell mate. It might be worth considering the moral dilemma introduced in the scenario and discuss about it with the trainees.  Note that in this scenario there might not be a need for forensic investigation as the evolution of the situation is clear and decontamination is not needed as ventilation is the only useful thing that can be done. However, it could be worth to investigate if there are hidden reasons behind the theft of the lamps. The decision to include this section of the scenario is left to the trainer, based on the trainees’ background.  Sources:  https://www.nti.org/analysis/articles/cns-global-incidents-and-trafficking-database  <https://www.epa.gov/radtown/tritium-exit-signs>  The Medical Basis for Radiation-Accident Preparedness - The clinical care of victims. Proceedings of the Fourth International REAC/TS Conference on the medical basis for radiation-accident preparedness - March 2001, Orlando, Florida. Ricks RC, Berger ME, O'Hara FM Jr. The Parthenon Publishing Group, USA, 2002 'Update on the Treatment of Internal Contamination', Goans RE., 202-204. | |
| **Application: First alarm (Topic 4.1)**  **Target audience: DO, FB, (M)P, AS** | **Learning objective:** To recognize signs of a potential CBRN release and (initiate first) respond(ers).  **Aim:** The dispatch officer interacts with the caller to identify the likelihood of a possible CBRN release and to know which information should be shared with the chain of command. Use of METHANE and Four W’s protocols. |
| Example: |  |
| **Application: Arrival on scene (Topic 5.1)**  **Target audience: FB, (M)P, AS** | **Learning objective:** To recognize how to carry out an on-site risk assessment, zoning of the area, and isolation and registration of victims.  **Aim:** The first responders arrive on scene, perform a risk assessment, talk with the caller, perform a reconnaissance of the incident scene and discuss actions. They apply METHANE, establish zoning, isolate people and pet animals, initiate evacuation, register persons. |
| **Example:** |  |
| **Application: Forensic awareness (topic 5.2)**  **Target audience: FB, (M)P, AS, EMS, GP** | **Learning objective:** To recognize how to carry out your work without forensic disruption of the scene.  **Aim**: The responders discuss the possible forensic value of the materials found on the scene and preserve the evidence. |
| **Example:** |  |
| **Application: medical treatment and triage (topic 5.6)**  **Target audience: FB, (M)P, AS, EMS, GP** | **Learning objective:** To recognize how to apply appropriate medical care towards patients involved in a CBRN incident.  **Aim:** The responders assess the medical conditions of the victims, perform triage on the victims and recommend possible treatment. |
| **Example:** |  |
| **Application: Alarm Protocol (topic 6.1)**  **Target audience: DO** | **Learning objective:** To differentiate a possible CBRN incident (from normal incident) and to carry out appropriate procedures & protocols.  **Aim:** The dispatch officer interacts with the caller and relays necessary information to the responders moving towards the scene. |
| **Example:** |  |