

# RELEASE THROUGH A MONITORED PATHWAY

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Part of the RASCAL Instructor-led Training

## MONITORED MIX - BACKGROUND

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- When a nuclear power plant effluent monitor detects a release, the release is likely to be a mixture of many radionuclides. However, the effluent monitor cannot identify the specific radionuclides present. The effluent monitor provides detector count rates and a plant computer will be used to calculate/convert activity release rates for noble gases, radioiodines, and sometimes particulates.
- Monitored releases will be filtered so they should be mostly noble gases but with a small proportion of iodines and particulates.

## MONITORED MIX - SCENARIO

Wolf Creek Generating Station had been operating at 80% percent power for about a week, and during a ramp-up back to 100%, a malfunction occurred causing the plant to shutdown at 15:50. Approximately 10 minutes later (16:00), an effluent release through a monitored pathway (stack height 211 ft) was detected by plant operators.



## MONITORED MIX - SCENARIO

The effluent release rate was reported to be 950 Ci/s for noble gases, 12 Ci/s for iodine radioisotopes, and 0.3 Ci/s for particulates. The plant's Technical Specification (TS) requires that the release duration must be limited to no more than 30 minutes and use predefined Standard Meteorology.



## MONITORED MIX - TASK

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Determine the projected TEDE and Adult Thyroid CDE at one mile and record the answers in the below provided spaces.

|                         | Dose at 1 mile | Dose at 5 miles |
|-------------------------|----------------|-----------------|
| TEDE (rem)              |                |                 |
| Adult Thyroid CDE (rem) |                |                 |

## MONITOR MIX - RESULTS

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|                         | Dose at 1 mile | Dose at 5 miles |
|-------------------------|----------------|-----------------|
| TEDE (rem)              | <b>0.5</b>     | <b>0.11</b>     |
| Adult Thyroid CDE (rem) | <b>3.9</b>     | <b>0.72</b>     |

### Conclusions?

- Will this method work for multiple release paths?
- Likelihood
- Uncertainty