# Release Through a Monitored Pathway

Part of the RASCAL Instructor-led Training

# Monitored Mix - Background

- 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 identity 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

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

| | Dose at 1 mile | Dose at 5 miles |
|---|---|---|
| TEDE (rem) | **0.5** | **0.11** |
| Adult Thyroid CDE (rem) | **3.9** | **0.72** |

Conclusions?

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