

ABSTRACT

Temporal Comparison of Atmospheric Stability Classification Methods

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The Nuclear Regulatory Commission recognizes two methods for the classification of atmospheric stability to support dose calculations from routine and emergency releases of airborne radioactivity. Many nuclear facilities measure temperature differences between two or more vertical levels of a tower, and use the vertical temperature difference (ΔT) as the primary means to determine atmospheric stability. Another acceptable method for determining stability class is based on the standard deviation of wind direction fluctuations (σ_{θ}). Both of these methods are listed as acceptable methods in Regulatory Guide 1.21 and Safety Guide 23.

This presentation describes an evaluation of the temporal comparability of the stability classes derived from simultaneous multiple ΔT and σ_{θ} measurements made through time. As a result of these comparisons, it was determined that there is only limited correlation between atmospheric stability classifications obtained from two sources situated on the same meteorological tower. This relative disagreement between methods presents special challenges for determining which indication is most appropriate to use for dose assessment efforts.

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