GROWING SEASON X/Q DETERMINATION

ChemStaff
Expert Consulting for the Global Power Industry

Value Delivered

- Clearly defined growing season & daylight hours
- Calculated X/Q values for relevant release points & receptor locations
- Quality assurance for historical meteorology data
- Updated effluent software & ODCM to reflect new dispersion factors & methodology
- More accurate & lower calculated dose due to carbon-14
- Turnkey update of dose assessment methodology

Industry Challenge

When the NRC began requiring nuclear power plants to account for carbon-14 in gaseous effluents, carbon-14 became a major—and often the primary—source of offsite dose for boiling water reactors. Since then, the NRC has been receptive to an alternative approach to assessing dose due to carbon-14. Instead of using the typical 24-hour, full year X/Q factors with conservative day- and night-time carbon-14 releases approach, it is more efficient to focus on a relevant subset of data—a carbon-14 dose based on effluents that are released during daylight hours of the growing season, because it is only incorporated into vegetation during daylight hours. This approach provides a more accurate means of assessing the dose impact related to carbon-14 in gaseous effluents, resulting in more accurate—and lower—calculated dose to the public.

ChemStaff Solution

At ChemStaff, we can meet this challenge with extensive effluent, radiological environmental monitoring, and meteorology experience to effectively provide comprehensive support for dose assessment. Our deeply knowledgeable specialists expertly prepare site daylight-hour, growing season X/Q factors for relevant receptor locations and release points. We meticulously review historical meteorological data and site topography to deliver quality assurance for such historical meteorological data. The experts at ChemStaff clearly define the growing season and develop representative monthly characterizations of site daylight periods to support the calculation of daylight growing season factors. Once prepared, these factors are incorporated into both the plant dose assessment methodology and the ODCM.