

Environmental Transport of Nuclear, Biological and Chemical (NBC) Releases

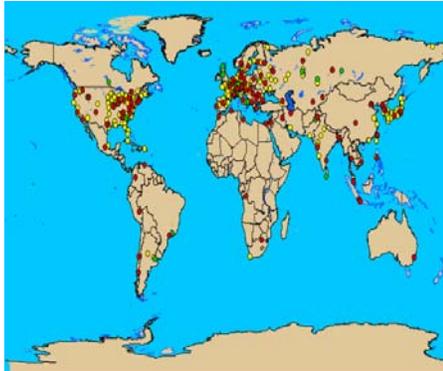
Hazard Prediction Analysis Capability Code (HPAC)

HPAC Code Description

The Hazard Prediction Analysis Capability (HPAC) software suite will estimate hazards resulting from the atmospheric transport of nuclear, biological, and chemical (NBC) materials and was initially developed for the Defense Threat Reduction Agency (DTRA) by a team that included ORNL and other DoD contractors. The ORNL Modeling and Simulation Group supplied technical expertise in the areas of radionuclide inventories and facility models for reactors worldwide, human health effects, population databases, and software system architectures. HPAC is a world-class analysis tool that has been forward deployed with the U.S. military in Korea, Bosnia, Kosovo, Iraq, and the Persian Gulf.

HPAC Modeling Capabilities

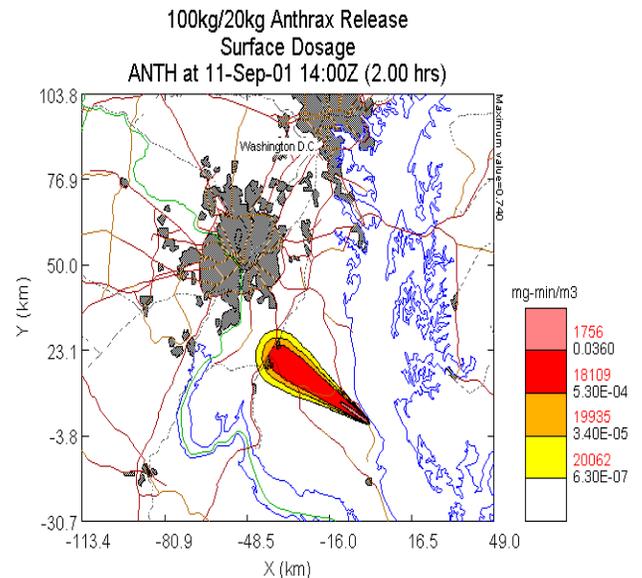
- Calculation of time and spatially-dependent concentrations of NBC materials
- Initial material releases resulting from detonation of nuclear, chemical, biological, or radiological weapons; fugitive releases from NBC facilities; and from nuclear attacks on biological facilities
- Treatment of biological agents such as anthrax, staph, and botulinum toxin; chemical agents such as GA Tabun, GB Sarin, VX Nerve, Triethyl Phosphate; as well as generic reactor-specific radionuclides
- Databases on worldwide population densities, terrain, land cover, real-time weather, and radionuclide inventories for larger-sized commercial and research reactors



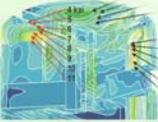
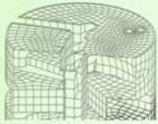
HPAC contains geometry models & corresponding radionuclide inventory data for all commercial & major research reactors worldwide.

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HPAC used to simulate a hypothetical anthrax release in the Washington, D.C. metro area



Modeling and Simulation Group

