PACE 3.3.4 Technical information

PACE (Probabilistic Accident Consequence Evaluation) is a code for performing level 3 Probabilistic Risk Assessment for accidents involving the release of radioactive material into the atmosphere.

PACE was developed by the Radiation Assessments Department (RAD), of Radiation, Chemical and Environmental Hazards (RCE) Directorate, part of UK Health Security Agency, an executive Agency of the UK Government Department of Health and Social Care (DHSC).

PACE was development as an Add-in to ArcGIS Desktop developed by ESRI (https://www.esri.com/en-us/home) and PACE users will need at least one licence for ArcGIS® Desktop to use PACE. PACE was developed and tested under ArcGIS desktop 10.0 and has been tested under versions 10.0, 10.2 and 10.5.1. PACE should work on all versions of ArcGIS Desktop later than version 10.0 and, because of future development plans for PACE, users are advised to get as late version of ArcGIS as possible, preferably later than 10.4. NB PACE will not work with the new ESRI desktop product ArcGISPro®.

PACE was developed to be used with ArcGIS in a Windows 7 (64-bit) environment; it has also been successfully used in a Windows 10 (64-bit) environment.

PACE has been designed to work with the UK Met Office's atmospheric dispersion model NAME3. However, the PACE licence does not include a license for use of NAME therefore PACE users wishing to use NAME3 will need to agree terms with Met Office independently. Once a NAME3 licence is granted PHE can provide the correct version of the NAME3 executable to work with PACE. NAME3 is not essential as PACE incorporates a simple Gaussian Atmospheric Dispersion model that can be used as an alternative.

Under PACE, NAME3 can use the following Meteorological Datasets available from the Met Office; MESUM5 (UK, Ireland most of France, 2002-2009), REGUM5 (Europe, 2002-2005) and 4KM50L_UM6 (UK, 2007-Present). Inclusion of more formats is planned.

PACE has been successfully and productively run on a laptop with the following specification:

Windows® 7 64-bit

Intel® Core I5 processor at 2.60 GHz

4GB Ram

300 GB hard drive

It should be noted that a full PACE run involves repeated modelling of atmospheric dispersion over potentially hundreds of different meteorological conditions, and this can take several days therefore higher specifications are preferable. Meteorological inputs can be large; for example, one year of MESUM5 data requires 235GB of Hard-drive space. Depending on user options, output files can also total 100s of GB. It is therefore preferable for the computer to have large local high drives e.g. 1-2 TB. NAME3 is a multi-threaded code and will therefore benefit from a multi-processor architecture.

The PACE installation requires approximately 0.5 GB of hard-disk space excluding Meteorological data but including default sets of data (population, agriculture and economics) for UK.