

**Nuclear Workforce Assumptions and Caveats**

<b>Attrition and retirement</b>	<p>The forward projection of the existing principal nuclear workforce (ie, Operations, Decommissioning, Engineering Construction and Defence workers) is based on retirement at (nominally) age 65.</p> <p>In addition to retirement, the current workforce is subject to a further attrition factor in the range 2% (lower band edge) and 8% (upper band edge). Tabulated data, and dotted curves, use retirement + 4%. This is included to account for all other routes through which the available workforce is reduced.</p>
<b>Data Sources</b>	<p>Data used in this analysis are valid as of June 2015.</p> <p>The national data from which this information is derived is supplied by SLCs, ECITB, CITB, MoD, NNL and Westinghouse</p>
<b>Full time equivalents and mobilisation numbers</b>	<p>Workforce levels are given as full-time equivalents in a year (FTE) - as distinct from mobilisation numbers which may be greater.</p>
<b>Internal supply (the projection in time of the existing workforce)</b>	<p>Internal Supply (the existing workforce projected forward) assumes perfect mobility between sites, unless accounted for with an additional attrition factor.</p>
<b>New build timelines</b>	<p>Timelines for nuclear new build are based on current NIA assumption of 'first concrete' date for; Hinkley Point C Q3 2017, Wylfa Newydd Q3 2019, Moorside Q3 2020, Sizewell C Q3 2021 and Oldbury Q3 2023</p>
<b>New Build workforce</b>	<p>The reactor models used are generic and based on EDF EPR estimates.</p>
<b>Programme Constraints</b>	<p>Data are subject to a number of influences on the programmes: financial approval, public spending reviews, regulatory approval, investment decisions etc.</p> <p>Resource profiles assume that all projects currently in scope will be progressed to full completion .</p>
<b>Resources codes and mapping.</b>	<p>Mapping of employer data to Resource Codes includes a degree of subjectivity - whilst every effort is made to agree the categorisation, this may affect consistency/accuracy of mapping.</p> <p>Resource codes form a hierarchy, from most granular to least, as follows: Low Level Resource Codes, High Level Resource Codes, Resource Code Type - see Technical Annex paper "Resources Codes and Role Levels"</p>
<b>Role levels used</b>	<p>Semi-skilled (L1)</p> <p>Skilled (L2)</p> <p>Technician/Team Leader (L3)</p> <p>Professional/Middle Manager (L4)</p> <p>Senior Manager (L5)</p> <p>These also translate to the following:</p> <p>Level 2 Operator</p> <p>Level 3 Craft/Technician</p> <p>Level 4+ Professional/Managerial</p> <p>Levels 1-5+ shown as an aggregated figure (ie, the sum of Levels 1,2,3,4 and above)</p>
<b>Supply Chain</b>	<p>The supply chain includes Engineering Construction, Manufacturing and other products and services. Those elements not counted in engineering construction have been estimated from multipliers derived from procurement models for the Sellafield site, normalised to site total workforce. Future supply chain demand is assumed to follow programme demand. See Technical Annex paper "Calculation of Supply Chain component"</p>
<b>Engineering Construction</b>	<p>New build: The data used is predominately sourced from the 1st unit reactor data from the NIA Capability Report. Therefore, consider the NIA assumptions associated with this profile in addition to the notes given below. The offsite profile features all workers and the ECI element has been extracted from the total demand.</p> <p>New Build: The profile assumes Front End Engineering Design (FEED) stage is complete and the start of the offsite workforce begins at the detailed engineering stage for the offsite component. The profiles within the template for the model are split according to the overall NNB laydown and, as such, there is a lagged effect on the onsite workforce starting. This is to ensure that the overall NNB profile is not distorted; however the accuracy of the crossover period must be treated with caution.</p> <p>New Build: Onsite and offsite workers interact and there is a crossover period. The laydown is based on the assumption that there is limited further requirement for re-design work, post building has commenced. However, in reality, the tail of the offsite workers is expected to be larger than it is currently defined. The onsite and offsite workforce profiles are illustrated as an 'ideal scenario'; in reality there is likely to be a difference in the profile structure (namely a flatter peak for a longer time period) as 85% of engineering definition will be complete before work starts in the field.</p> <p>Currently Operational &amp; Decommissioning Sites: The data required for the Nuclear Workforce Model (NWM) has been segregated by individual nuclear sites and, as such, assumptions have been made on the separation of the overall ECI nuclear sector on all sites. The aggregated format of the data is therefore a more accurate portrayal of the current and projected ECI nuclear workforce. The assumptions are based on current information and knowledge available, as at April 2013. It is likely that the assumptions will need to be altered and developed further as the sites progress through each lifecycle.</p> <p>Currently Operational &amp; Decommissioning Sites Current Population: information on manpower requirements was sourced from several currently operational nuclear sites. As the information obtained was categorically of a similar magnitude, to increase the</p> <p>Currently Operational &amp; Decommissioning Sites: S1M proportions are used to determine the breakdown in the split of ECI workforce reported working onsite at nuclear sites and the 'offsite' workforce working on nuclear projects</p>

	<p>Currently Operational &amp; Decommissioning Sites - Decommissioning Sites Demand: 2011 is used as a base year (same as current supply) and, post this date, a yearly interval of workers is assumed. Dependant on decommissioning dates, in particular C&amp;M preparation start and end dates, this has led to an indicated change in workforce levels. Please exercise caution regarding these assumptions. For example, Magnox are currently working on workforce profiling and, therefore, it is likely that the assumptions and workforce levels required will alter as the sites progress. Sellafield and Dounreay are assumed to remain at a steady state due to no further information available. The profiles are supplied in months, at quarterly yearly intervals starting at month zero. Onsite workers are defined as those who work wholly or mainly (50% or more) on a site. Offsite workers are therefore those deemed to not be working mainly on site and are categorised as all other workers.</p>
<b>Civil Construction</b>	<p>There is no overlap between engineering construction and civil construction</p> <p>No significant changes to construction build process exist across the programme of work</p> <p>Similar levels of site preparation work apply at each new build site</p> <p>Overall construction demand is forecasted against long term econometric model. Supply data is an assessment of how demand relates to overall workforce</p> <p>Employment demand based on full time equivalents (FTEs)</p> <p>Shifts in retirement age or occupational mobility will need to be taken into account</p>
<b>Manufacturing</b>	<p>Manufacturing is part of the nuclear supply chain and estimated to amount to around 4000 FTEs, distributed within the non-ECI supply chain workforce (see paper, "Calculation of Supply Chain")</p> <p>New build manufacturing uses the working assumptions developed by the NIA for off-site manufacturing of equipment and components that could, in principle, be supplied from the UK. It does not include reactor pressure vessels, steam generators, reactor coolant pumps and main turbines.</p> <p>Off-site manufacture of construction materials (eg rebar, cement) is not included.</p>
<b>Operations</b>	<p>Cogent has assumed 7 year extensions to published closure plans to existing EDF generating facilities.</p> <p>Operations, Decommissioning and Fuel Processing data from SLCs is quoted in units of FTE (Full Time Equivalent for one year).</p> <p>Forecast decommissioning data for currently operating EDF facilities has been estimated from the profile supplied by the NDA for Wylfa.</p>
<b>Defence</b>	<p>The return includes data from the Defence Infrastructure Organisation (DIO) and their Tier 1 partners, for work they are expected to undertake on behalf of the Submarine Enterprise</p> <p>DNSR were partly included in the 2014 submission, they are now fully represented</p> <p>The MoD NSQEP estimates for civilian and military resource have been improved with a small increase in their numbers</p> <p>All the military NSQEP resource (circ. 2000) has for expedience been applied to resource family 'Engineering - Mechanical &amp; Electrical &amp; Non-Specific'</p> <p>There are MOD resources attached to Naval Command that support submarine operations at the naval bases that have not been included</p> <p>Military resource is approximately 5000</p>
<b>Research and Development</b>	<p>NNL data covers only those NNL staff on a technical career path, some 40% of the total</p>