

# Nuclear Skills - A Review

**Labour Market Research** Towards the end of 2008, Cogent commissioned in-depth research on the nuclear labour market by the sub-sectors power generation, decommissioning, defence and nuclear new-build. This work captured the employed operating workforce for which no clear national data repository exists with the Office for National Statistics. Cogent has also commissioned parallel research on pinch points in the supply of skills for new build, especially the manufacturing and construction contractors. In this endeavour Cogent has worked with the support of the Office for Nuclear Development, the National Skills Academy Nuclear and other strategic skills bodies to add value to our work.<sup>1</sup> Our latest publication schedule for the “Renaissance” research series is:<sup>2</sup>

## 1. The Civil Nuclear Workforce

A comprehensive regions, nations and industry skills picture of the operating workforce, with an industry-wide skills classification system and new-build scenarios for nuclear operations. Estimated publication date: quarter 3 2009.

## 2. New-Build Nuclear Skills Capacity & Capability

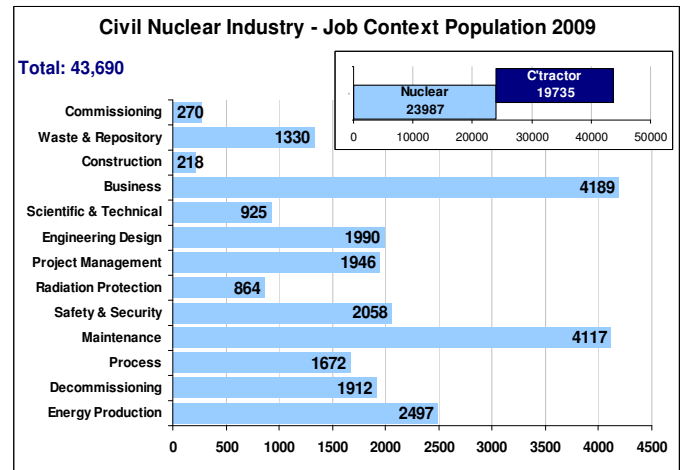
A cross-sector model of the skills envelope required to produce one PWR unit. Quantifying labour demand and pinch-points from planning and manufacture to construction and operations. Estimated publication date: quarter 4, 2009.

## 3. Nuclear Skills Futures

An industry round-up, including the latest defence and supply-chain analysis in the run-in to the publication of the national Nuclear Policy Statement. Estimated publication date: quarter 1, 2010.

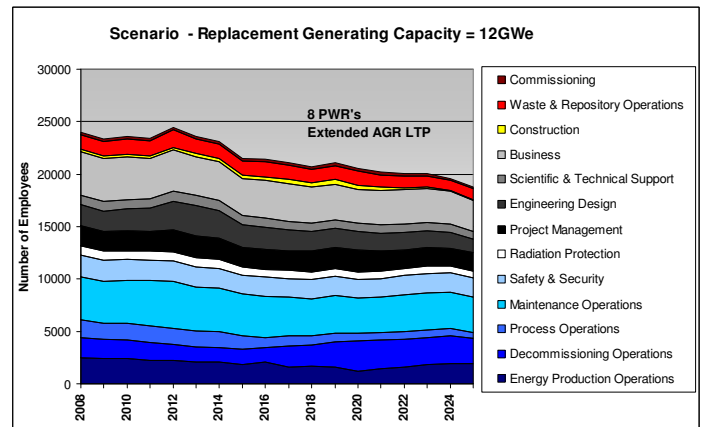
**The Operating Workforce 2009** The operating workforce consists of those employed and contracted by the nuclear operators mainly in decommissioning and energy production. Today this combined workforce is estimated to be of the order of 44,000. Those directly employed by the operators make up just over half of this at 24,000. The following figure illustrates the detail.

Given the long timescales involved in any future new build, it is clear that a decline in nuclear power generation is unavoidable in the medium term. As the operating companies estimate that nuclear new-build will not have a significant impact on their workforce until 2016-17 at the earliest, the first major shift in skilled labour will be in expansion of decommissioning of the AGR fleet.



## Operating Demand Projections 2009-2025

In projecting to the future, the most indistinct variable is the new-build scenario. The existing estate and associated lifetime plans can be tightly defined. We have put together a hypothetical scenario of 8 new PWRs and across-the-board lifetime extensions to the existing AGR estate. This gives a useful comparator to today's workforce should the widely reported ambition of replacement of current generating capacity be achieved. It is, or course, possible that more new nuclear generating capacity will be commissioned as the various utility consortia emerge.

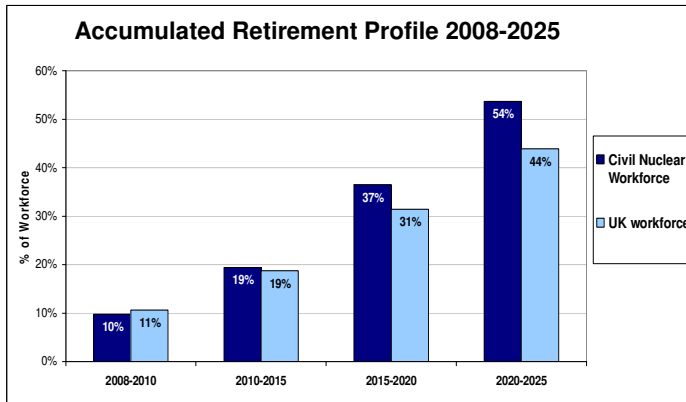


The 'replacement capacity' model demonstrates a 25% decline in the size of the operating workforce needed by 2025 - reducing from 24,000 to 18,000 (44,000 to 33,000 including the contractor community). This overall decline in the workforce for a similar generating capacity is largely derived from the higher individual output capacities of new-generation PWRs together with more efficient gearing of support and maintenance. However, this decline is outstripped naturally by the age profile (see below) so that skills shortages still emerge.

<sup>1</sup> Includes National Skills Academy Nuclear, Construction Skills, Engineering Construction Industrial Training Board, Energy and Utility Skills, Nuclear Decommissioning Authority, Department of Business Innovation and Skills, the Office for Nuclear Development.

<sup>2</sup> See also: *Energy Skills: Opportunity and Challenge, A Response to the Energy White Paper*, Cogent SSC, October 2008, [http://www.cogent-ssc.com/research/Publications/publications/EWP\\_Skills\\_Reporting.pdf](http://www.cogent-ssc.com/research/Publications/publications/EWP_Skills_Reporting.pdf); *A Gap Analysis for the Nuclear Industry* Cogent SSC, May 2006, [http://www.cogent-ssc.com/pdf/Nuclear\\_Gap\\_Analysis.pdf](http://www.cogent-ssc.com/pdf/Nuclear_Gap_Analysis.pdf)

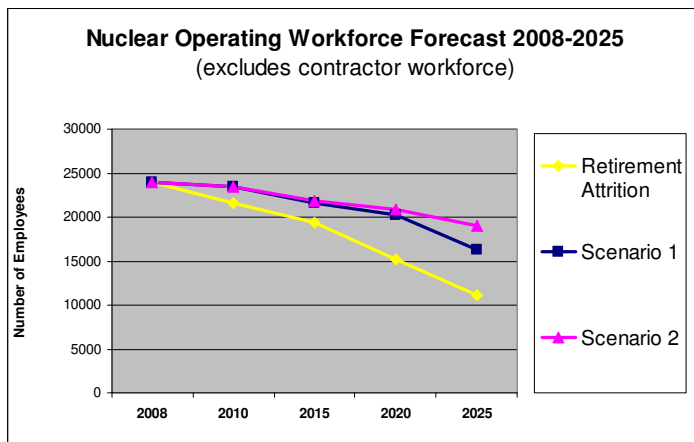
**Age is Overriding** The age profile of the operating workforce dictates that replacement of current nuclear generating expertise will be a skills supply, retention, reskilling and upskilling challenge. It is suggested that only in the event of the utilities extending considerably beyond replacement of current capacity that the expansion demand from new generation would be of similar impact to the replacement demand due to natural retirement attrition.<sup>3</sup>



The operating workforce is significantly older than the general UK workforce. This begins to impact around 2015, at least three years earlier than any new-build generating demand emerging around 2017-2018. This profile drives the current employed establishment well below the projected contraction in labour demand, thereby inducing expanding skills gaps with time.

### Operating Workforce - Skills Gap Projections

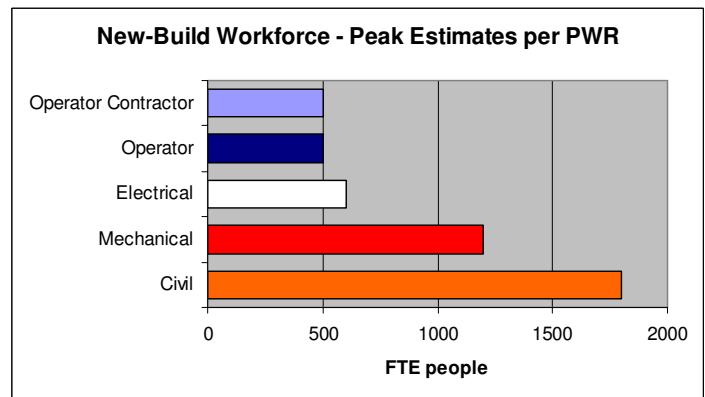
Using a replacement capacity model which takes into account the impact of the improved technology of new nuclear power station designs and of the age profile of the workforce, it is estimated that the shortfall across all skilled categories in the operating workforce will be of the order of 8,000 (14,000 including contractors) by 2025. (Scenario 2 in the illustration below refers to the replacement new generating capacity scenario used in this paper; Scenario 1 refers to an alternative at half this capacity.)



**New-Build Nuclear and the Supply Chain** The NIA recently updated its study of the supply-chain capability for new build,<sup>4</sup> concluding that the resources of the UK supply chain in engineering, manufacture and construction required for modest new build would be capable of servicing most of the capacity and capability.

In contrast to the largely full-time employed operating workforce, the supply-chain workforce will be transient in the sector for the period of new build only. Account of this workforce must be tightly defined as labour will be intensely active for defined periods. Headcount of this workforce can be as high as 20,000 but the count given here (up to 5,000 per PWR) is based on peak full-time employed equivalent. The illustration below provides a new-build workforce estimate which is currently being tested with key employers from the UK supply chain. Following testing, amendments will be made before the findings are published and benchmarked to other projects such as Flamanville.<sup>5</sup>

Estimates of the manufacturer workforce demand (absent from the illustration below) are of the order of 500 FTE per PWR unit but in this area global capability (e.g. large forgings) will be a determinant.



Standards of quality and competence for nuclear new build will be orders of magnitude greater than most construction and manufacturing projects. Accordingly, the sector skills organisations have a role in evidencing and supplying solutions to ensure that the skills needed for jobs both today and tomorrow are in place.

### Next Steps

The sector skills organizations, as appropriate, to:

1. Complete the research and publication schedule.
2. Consult with sectors and regions on the findings to develop and refine intervention and promotion strategies.
3. Establish a Supply Chain Expert Panel to monitor and refine skills gaps as nuclear new build emerges.
4. Work with companies on employer training accreditation, apprentices and the pledge.
5. Populate the Nuclear Industry Training Framework.
6. Roll out the Skills Passport for Nuclear.

<sup>4</sup> The UK Capability to Deliver a New Nuclear Build Programme, NIA, 2008

<sup>5</sup> EDF reports 2,300 employed over 5 years to construct Flamanville 3 from 2007-2012 <http://energy.edf.com/edf-fr-accueil/edf-and-power-generation/nuclear-power/the-future-of-nuclear-power/ep-r-flamanville-3/the-flamanville-3-project-122321.html>

<sup>3</sup> B Murphy, Research Director, Cogent SSC, in 'Time to Power Up the Nuclear Generator of Jobs,' Daily Telegraph, March 12, 2009