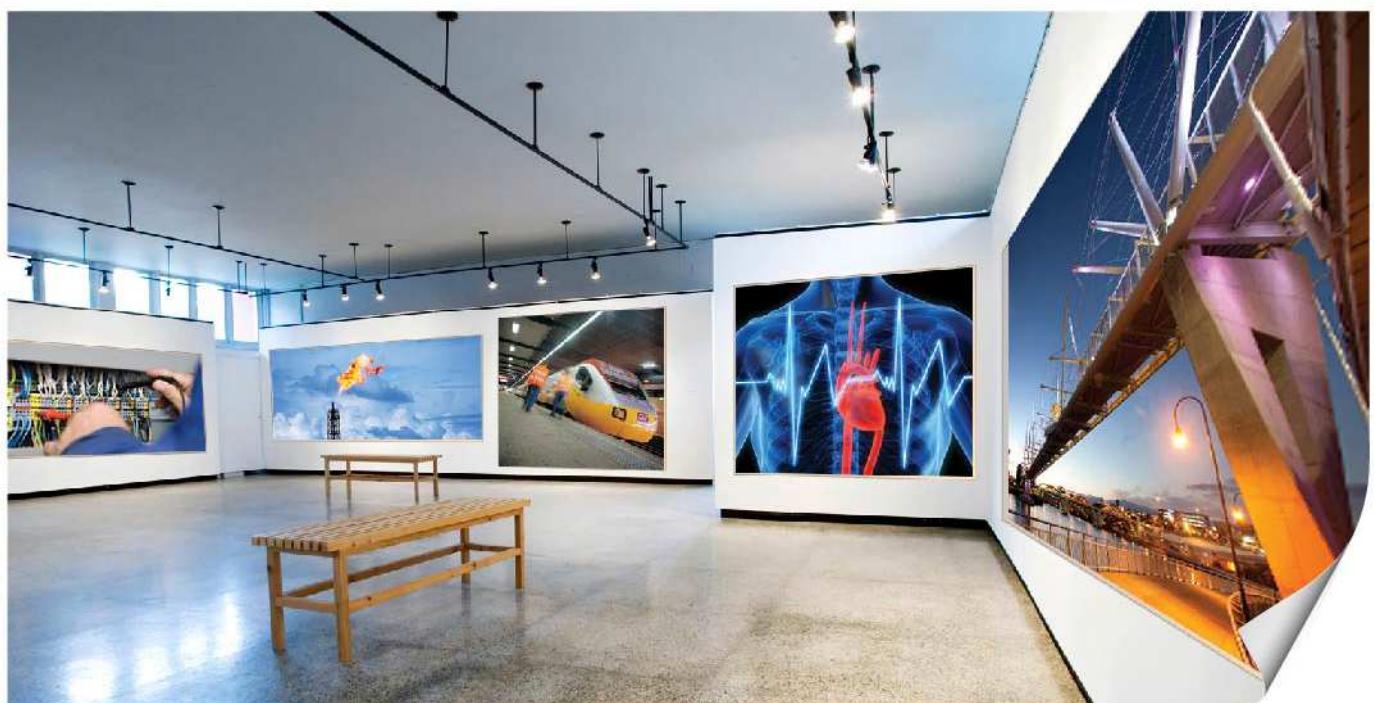
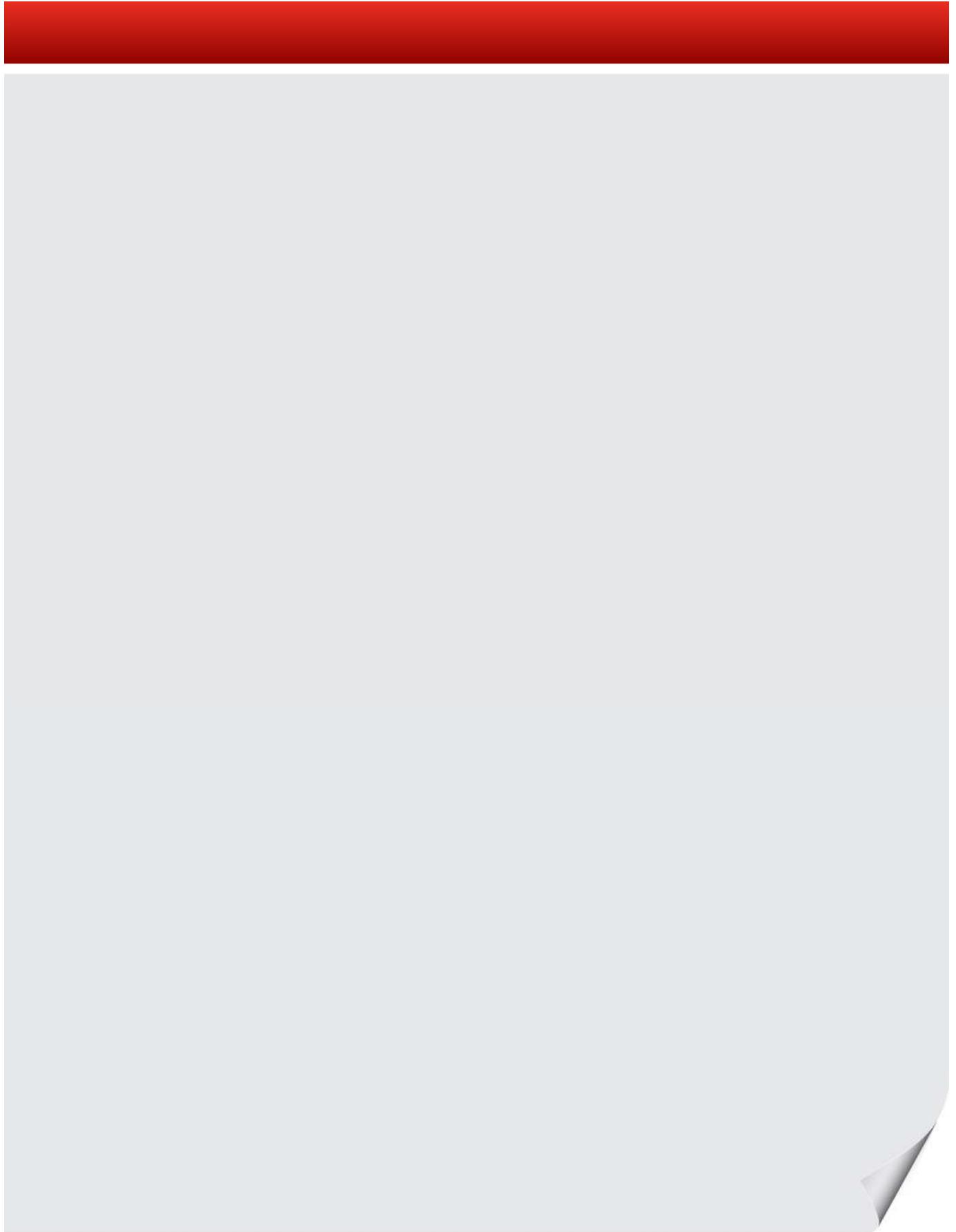


# THE ENGINEERS AUSTRALIA SURVEY OF WORKING ENVIRONMENT AND ENGINEERING CAREERS, 2012





THE ENGINEERS AUSTRALIA SURVEY OF WORKING ENVIRONMENT AND ENGINEERING CAREERS,  
2012

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## **EXECUTIVE SUMMARY**

Australia's persistent shortages of experienced engineers was brought about by the coincidence of an unprecedented resources boom and a resurgence in infrastructure activity. The additional engineers required could not be supplied from domestic sources and skilled migration now provides over 70% of Australia's new engineers. Two factors accentuate the supply difficulties; engineering has remained male dominated and hence domestic recruitment is constrained to half of the population, and, once trained, less than two-thirds of engineers actually work in engineering, responding instead to opportunities in other parts of the economy.

Retention of trained personnel in engineering is a challenge for both men and women, but is acute for women. The issues of improving the retention of women in engineering and increasing the number of women engineers are not independent from the challenge of retaining more men in engineering, particularly those who came to Australia as skilled migrants. The pressures of engineering skill shortages have improved retention marginally over the last five years, but the pace of change is inadequate and the pressure for change is not sustainable.

Engineers Australia believes it is critical to better understand the issues influencing the retention of engineers in engineering and the impediments to increasing the number of women in engineering, as part of a longer term strategy to improve the domestic supply of engineers. Long term reliance on skilled migration is risky because it assumes continuity of supply from other countries, each intent on developing their own economies. To this end, in 2012 Engineers Australia undertook a comprehensive survey of its members to explore the working lives of engineers. The objective was to identify issues conducive to engineering careers and those that were not with a view to building the background necessary for a long term approach. This report documents the findings of the survey.

The labour force participation rates of trained men and women engineers are quite high compared to the general labour force and are consistent with similar trends in other skilled professions. But there is irrefutable evidence that participation falls when women have the responsibility of children. The key point is that the falls in participation are larger in engineering than elsewhere.

Survey participants were members of Engineers Australia and demonstrated more active labour market participation than engineers in general. Employment was very high and unemployment particularly low. Most employment was full time and the prevalence of part time work was not high; census statistics show that part time work in engineering is only about half the level in other professions and in turn, among survey participants, part time work was even lower being about half the level in engineering in the wider economy. The survey response comprised 9.3% of Engineers Australia's members who were at least Graduate members and 19.9% of women members. All Divisions and Colleges were well represented.

Both men and women engineers are highly qualified with a large proportion holding post graduate qualifications in engineering and in other disciplines. The bulk of employment was in permanent salaried positions with a minority in casual or contract positions or working as owner/operators of businesses. About three-quarters of employment was in the private sector with the balance in public sector agencies, departments, utilities or educational

institutions. Employment was concentrated in large organisations, typically with over 500 employees.

Engineers undertake a mixture of technical and design work and engineering management responsibilities. In younger age groups the balance was skewed towards technical and design work with more management responsibilities becoming evident with age and experience. The survey showed this pattern was common for men and women and while no statistical differences were evident in the two youngest age groups, from the 40s onwards the evidence suggested that women engineers were less likely to have management responsibilities than men.

Men and women engineers have different approaches to hours worked. Men are more likely to work long hours than women who in turn are more likely to work hours that conform to the "standard working week". The impact of age on this result was examined and showed it was consistent irrespective of age group.

Women engineers earn lower salaries than men. In this study, the influences of part time versus full time work and age, as a surrogate for experience, were separated. There was no distinction in salaries between men and women working full time and aged 20 to 29 years. In part time work in this age group women earned lower salaries than men. In all other age groups there was strong evidence that women engineers earned less than men in both full time and part time work.

Engineers are potentially mobile individuals with only about 60% strongly attached to their present jobs in the immediate future and about 25% thinking about a change over the next 12 months. Gender differences were confined to women in the 30 to 39 years age group where there was evidence of a stronger inclination towards changing jobs than other groups. The reasons why survey participants would change jobs in the next 12 months were predominantly ones related to career advancement. Reasons to do with leaving engineering were at the bottom of the list and obviously outside of mainstream intentions. Other research shows that engineering employment is subject to very high year to year variability and suggests that the strength of this result in the light of employment variability warrants further research.

Most engineers expressed a high level of satisfaction with their jobs. When asked their views on 18 different aspects of their jobs and their overall assessment of it, on all except a few aspects, the weight of opinion was strongly skewed towards feelings of satisfaction. Issues related to physical working conditions, freedom to choose work methods and working arrangements, levels of responsibility and work variety rated particularly highly. The issues that rated the lowest were common to men and women and were opportunities for promotion and management of workplaces; 24% of men and 28% expressed dissatisfaction with promotion opportunities and about 20% expressed dissatisfaction with how their workplaces were managed.

At aggregate level no gender differences in job satisfaction were found. This was also the case for the 20 to 29 years age group. However, strong evidence was found to support the view that women were less satisfied than men with key aspects of their jobs, in the 30s, 40s and 50s age group and for some aspects, the 40s and 50s age groups. The issues where differences were found related to the level of responsibility allocated, opportunities to use abilities, employee management relations, opportunities for promotion, hours of work, office communications and opportunities for continuous staff development. The results formed a

pattern of lower satisfaction among women engineers compared to men that cannot be ignored and should be further explored.

Almost three-quarters of survey participants worked to formal job descriptions, but only about 60% were of the opinion that their job description was a fair indication of what they did. Performance appraisal systems were common and almost half of participants had salaries linked to appraisals in some way. Only about one-quarter of participants said that clearly written promotion criteria were used by their employer and less than 40% said their employer offered a well-defined career path. Almost twice as many survey participants said their employer offered career paths outside of engineering.

The survey found that involvement in organisational decision making was not high with under 20% of participants involved in decisions at least most of the time and 36% of men and 52% of women never participating. These aggregate statistics were statistically different, but statistical difference in the involvement of men and women could not be replicated for the 20s and 30s age groups, but was supported in respect to the involvement of the 40s and 50s age groups.

Questions about the availability of flexible working arrangements produced very positive results with several common forms of flexibility broadly available to a high degree. However, take-up of these opportunities was an entirely different story. The two most common mechanisms used were flexible hours and leave without pay. Other forms of flexibility had very low take-up rates compared to availability. The reluctance to use flexible working arrangements has endured since prior to a 2007 survey and is a major point of interest for further work.

Paid career development opportunities were available to about 70% of survey participants with development opportunities outside of engineering available to about two-thirds of participants. These opportunities were more often than not unavailable when participants were on maternity or paternity leave.

Care of children and other dependents was an important issue for about one quarter of survey participants and a large proportion did not have access to adequate care arrangements other than themselves. Over 81% of women and 74% of men subsequently said that family friendly working environments were at least important to them. There was strong evidence that women were more inclined to this view at the aggregate level and in every age group.

The survey showed that the vast majority of engineering workplaces have supportive, team oriented cultures conducive to productive working relationships. However, when questions turned from the general to specific ones it was found that the prevalence of sexual harassment, discrimination and bullying was unacceptably high. Gender was a factor in all three; race, age and being new to a job were factors in discrimination and bullying. In the case of bullying, “other factors” drew an unusually high response suggesting broad based attitudinal factors.

This was a survey of Engineers Australia members who are highly committed to engineering. The results cannot be said to be reflective of qualified individuals who have moved away from engineering into other areas of work or of non-members. Although a large proportion of survey participants were happy in their work, the degree of unhappiness with promotion opportunities and management of workplaces should be matters of concern.

The survey results suggest that women engineers are treated differently to men starting with salaries and extending to a wide range of matters that fall within normal job expectations. These issues do not always affect all age groups; and are typically absent for the youngest age group, 20 to 29 years. Workplace culture continues to be a troubling issue; while three-quarters of men and women described their workplaces supportive and collaborative, the prevalence of sexual harassment, discrimination and bullying were at least as high, if not higher than benchmark statistics for the wider community. Gender is an important underlying factor, but race, age and being new to the job also stand out as considerations.

Surveys such as this are useful sources of information, but because it was directed at members of Engineers Australia, may not be the best basis for broad policy decisions. However, the results reported, taken in conjunction with earlier surveys provide more than mere background. They point to a complex set of factors that should be addressed by the engineering profession in order to increase retention of men and women in engineering and to convince more young women that engineering is a viable career for them in a modern society.

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# 1 THE ISSUES

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This chapter provides background information about two key issues in engineering; the gender gap between men and women and the retention of trained engineers in engineering. The issues are put into context by relating them to future economic growth and statistics describing recent events. Other issues covered include, earlier surveys and the design and administration of the 2012 survey.

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## 1.1 The Present Situation

The past decade has seen persistent and chronic shortages of engineers. Even when economic activity slowed in the depths of the global financial crisis, skill shortages persisted. Engineers Australia has argued that Australia must do more at home to solve the large gap between the demand for engineers and the number of engineers produced by the Australian education system. Although skill shortages affect many fields, engineering is now unique. Recently released census statistics show that over 70% of the increase in the supply of engineers between the 2006 and 2011 censuses were skilled migrants<sup>1</sup>. Long term reliance on importing engineers is problematic and risky because as other nations develop, their demand for engineers will increase and bring with it the conditions and incentives for engineers to remain at home and forego migration.

Two key factors must change if Australia is to improve the home grown supply of engineers. First, engineering in Australia has been, and remains, male dominated. The changes that have occurred during the past two decades have produced outstanding women engineers. For example, in 2011 both the professional engineer of the year and the young professional engineer of the year were women. Despite these examples, the latest census statistics show that women comprise just 11.8% of Australia's supply of engineers and even lower if reliance on skilled migration is discounted. Australian engineering faculties already draw disproportionately on well qualified young men completing school but miss out on the majority of well qualified young women. Attracting more young women into engineering will not just lead to improved numbers, but will maintain the high standards the profession has set for itself.

A recent study showed that closing the gender employment gap in several areas, including engineering, could increase Australian gross domestic product by between 11% and 20%<sup>2</sup>. The critical role of productivity growth as Australia's demographics change was outlined by the Australian Treasury<sup>3</sup> which argued that most of Australia's historical growth in gross domestic product was from growth in productivity, and this process will become even more important in the future as the Australian population ages. The role of engineering and innovation in productivity growth is well established. As well, the present engineering labour force is aging and will need to be replaced. Unless the

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<sup>1</sup> See Engineers Australia, Inter-Census Changes in the Australian Engineering Labour Market, 2 November 2012, and also The Supply of Engineers in Australia; A Decade of Skilled Migration, 23 March 2012, [www.engineersaustralia.org.au](http://www.engineersaustralia.org.au)

<sup>2</sup> Goldman Sachs JBWere; Australia's Hidden Resource: The Economic Case for Increasing Female Participation, Research Report, 26 November 2009, [www.gsbw.com](http://www.gsbw.com)

<sup>3</sup> The Australian Treasury, Australia to 2050: future challenges, January 2010, [www.treasury.gov.au](http://www.treasury.gov.au)

gender gap is addressed, the future potential of the Australian economy will be seriously impeded.

The second factor is that Australia must improve the return from investment in engineering education and training. In the 2006 census, 62.6% of men and 47.1% of women who were qualified to be engineers actually worked in engineering. These figures had improved marginally to 63.6% and 51.2% respectively by the 2011 census, but are quite low compared to other professions and community perceptions. Engineering training in problem solving and analytical skills means that engineers are highly valued in occupations that require these skills. But competing demand is not the full story. A raft of factors combines to shape the views of individuals about their jobs and careers. These factors affect all engineers and it is important to obtain information about them so that appropriate policies can be designed to retain more engineers in engineering.

Well over twenty years ago, the Commonwealth Government enacted changes to facilitate equity in career and work choices for women. Part of the motivation was to improve social equity, but work force changes and overall Australian productivity were not far from mind. Though far from perfect, the merit principles promoted in this framework have produced positive change. In 2012, 42% of the APS managers and 35% of senior executives<sup>4</sup> were women.

As the labour force participation of women has increased, the interaction between work and family has increased in importance. Once thought to be simply a “women’s issue”, family friendly working environments are increasingly recognised as relevant and important to the working lives of men and women. Innovative employers have recognised that simply providing family friendly working arrangements is no guarantee that employees will use them. It is essential to go the extra step to ensure that employees accept that using these facilities will not jeopardise jobs and career prospects<sup>5</sup>.

These developments mean that it is no longer sufficient to take a gender specific approach to work place and family friendly issues. This does not mean that there are no gender specific issues to resolve, it means that identifying them needs to occur in a broader context of change, one which recognises that the attitudes of men, as well as women, have changed. The statistics cited above show that engineering has a severe gender imbalance, but that the low utilisation of engineering skills in engineering is an issue for men and women. Both problems must be solved to ensure Australia’s economic future. The matters explored in this report inform aspects of the solution.

## 1.2 What this Report is About

This report explores the workplace experiences of engineers who are members of Engineers Australia to provide insights for the design of Engineers Australia policies that aim to increase the number of women in engineering and to improve the utilisation of engineering skill in the Australian labour market. For women in particular, these issues are critically inter-related. The report is based on Engineers Australia’s survey of Working Environment, Flexibility, Job Satisfaction and Engineering Careers conducted during July and August 2012.

In the past, efforts to increase the number of women engineers and to improve the retention of women in engineering were based on more gender specific approaches. Notable resources were the surveys of women in engineering conducted in 1999 and again in 2007. Reports outlining these surveys and the results obtained are available on

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<sup>4</sup> Australian Public Service Commission, Fact Sheet 1: The Big Picture, 2012, [www.apsc.gov.au](http://www.apsc.gov.au)

<sup>5</sup> Matthew Gray and Jacqueline Tudball, Family Friendly Work Practices: Differences Within and Between Workplaces, Research Report No 7, Australian Institute of Family Studies, May 2002, [www.aifs.gov.au](http://www.aifs.gov.au)

Engineers Australia's web site<sup>6</sup>. The 2012 survey aimed to be representative of all Engineers Australia members. This approach recognises that, as noted above, work place arrangements and satisfaction are relevant to all members. Like earlier surveys, the 2012 survey included both men and women, but a key difference is that the 2012 survey was projected as a survey of all members to ensure appropriate coverage of the views of both men and women on the matters canvassed. Gender differences are examined in the analysis of survey results against the background of comprehensive coverage of the views of all members.

### 1.3 Administration of the Survey

There were 72 questions in the 2012 Working Environment, Flexibility, Job Satisfaction and Engineering Careers Survey (the Survey) with numerous questions containing multiple sub-questions. The questionnaire is reproduced in full in the Appendix. Many questions were based on the 2007 survey of women in engineering<sup>7</sup> but many questions were generalised and additional questions were included. All questions were designed to facilitate numerical collation by including additional options.

An important difference to earlier work was to pitch the survey to Engineers Australia's membership framework of the engineering team. The engineering team is comprised of professional engineers (at least a four year full time bachelor degree in engineering), engineering technologists (at least a three year full time bachelor degree in engineering) and associate engineers (at least a two year full time associate degree or advanced diploma in engineering). Over time associate engineers qualifications have become less popular than they once were. This is evident in age statistics and is particularly relevant to women engineers most of whom are professional engineers. It is important that information gathered to inform the organisation's policy processes be fully reflective of the membership base and the 2012 survey gave this matter particular attention.

The questionnaire was critiqued by numerous staff and members of Engineers Australia, including members of the Women in Engineering National Committee. Numerous changes were made as a result of the feedback received. However, this process falls short of rigorous field testing of all questions and the few errors that slipped through had minimal impact.

The survey was conducted between 18 July 2012 and the close of business 20 August 2012 and was open to members of Engineers Australia who were at least Graduate members in the three occupational groups outlined above. Survey response was voluntary and so did not conform to a formal statistical design. Participation in the survey was encouraged through the offer of a \$500 Coles-Myer voucher to a randomly selected member who completed the questionnaire. The survey was administered on-line using "Survey Monkey" a commercial survey package often used by Engineers Australia. There are always some compromises when standard packages are used, but, on-balance the on-line capabilities of Survey Monkey, its question design capacity, editing and down-loading facilities were important considerations.

Members were alerted to the survey in a number of ways. The Chief Executive Officer of Engineers Australia wrote to the Chairs of all Colleges and National Committees advising them about the survey and its objectives and enlisting their support to encourage widespread participation. The Director, Policy and Public Relations provided detailed advice to all Engineers Australia Divisional Directors about the survey and asked that

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<sup>6</sup> [www.engineersaustralia.org.au](http://www.engineersaustralia.org.au)

<sup>7</sup> See Appendix 1 in Mills, Mehrtens, Smith and Adams, CREW Revisited in 2007 The Year of Women in Engineering, 2008, a Report for Engineers Australia, [www.engineersaustralia.org.au](http://www.engineersaustralia.org.au)

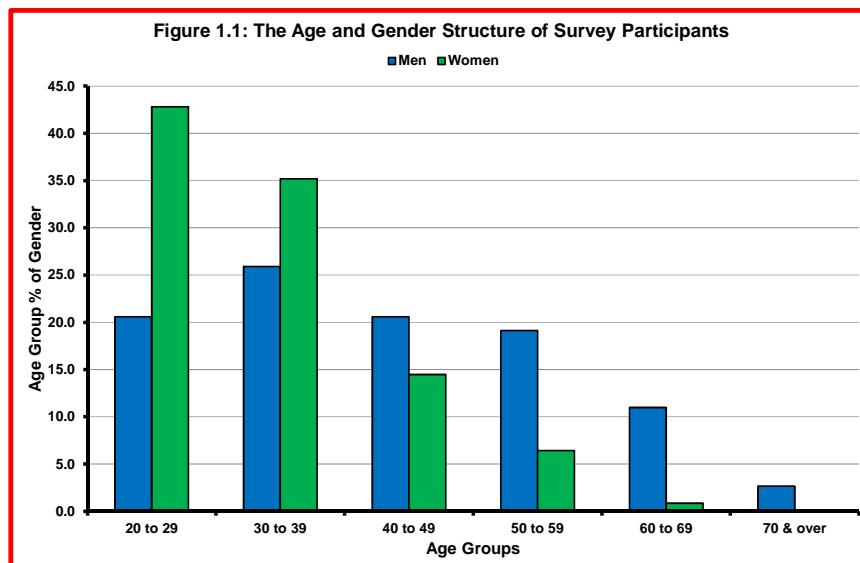
they utilise all facilities in their Divisions to advise members about the survey and to encourage participation. On the 18 July 2012, a personal email was dispatched under the signature of the Chief Executive Officer to all members of Engineers Australia inviting participation and providing a direct link to the survey questionnaire. This was followed up by a reminder email under the signature of the Director, Policy and Public Relations on 10 August 2012.

The home page of Engineers Australia's web site highlighted the survey with a rotating banner between 18 July and 20 August 2012. The banner advertised the survey, invited participation, and provided a link to the questionnaire. This link required member to negotiate the conventional member log-on facility commonly used by Engineers Australia to ensure only members participated in the survey.

At the conclusion of the survey responses had been received from 6,146 members; 5,125 men, 932 women and 89 individuals who did not answer the gender question. This represented 10.3% of engineering team membership on the 30 June 2012; 9.3% of the men and 19.9% of the women. The level of response was very high for an on-line survey and the characteristics of the respondents provided a high degree of confidence that robust insights into members' views were obtained by the survey.

### 1.4 Analysis of Survey Results

Official statistics indicate that the age structure for women engineers is much younger than for men. Survey responses reflected this issue as shown in Figure 1.1. This structure conveys an important message for the analysis of survey results, age structure (and by implication, seniority and experience) may explain some of the differences between men and women. However, providing analysis takes this into account, remaining differences reflect gender differences.



The 2012 survey outcomes had similarities and differences compared to the 2007 women in engineering survey. The structure of responses from women was very similar between the two surveys. In 2007, 49.8% of women participants were aged 20 to 29 years, higher than the 42.8% in this group in 2012. Women participants aged 30 to 39 years was similar in size, about 34.5% in 2007 and 35.2% in 2012. The structure of men survey participants in 2012 was different to 2007 since in 2007 the sample of men was selected to match the sample of women. In 2007, over 50% of men were aged 20 to 29 years compared to 20.6% in 2012. The proportions in the 30 to 39 years age group were

closer with about 30% in 2007 compared to 25.9% in 2012. There were important differences between the surveys in the proportion of participants in older age groups. In 2007, there was scarcely any gender difference in the proportions of respondents aged 50 years and over. However, in 2012, 32.8% of male respondents were aged 50 years or more compared to just 7.3% of women.

These observations were incorporated into the survey analysis by structuring the results in the following way:

- Responses from men and women were compiled into separate files; this meant that the 89 participants who did not answer the gender question were excluded.
- Within each gender, separate files were compiled for each age group.

## 1.5 Background Statistics

Over the past seven years, Engineers Australia has accumulated a large body of statistics on engineers and engineering from official sources, its own collections and the collections of related bodies such as APESMA. Key publications are regularly available from the "Advocacy" section of Engineers Australia web site and most statistics are updated annually in *The Engineering Profession: A Statistical Overview*. In 2012, an information paper providing a statistical update on women in engineering was released<sup>8</sup>.

This report is primarily concerned with the results of the 2012 survey of Working Environment, Flexibility, Job Satisfaction and Engineering Careers, but it is important to establish the benchmarks within which these results can be evaluated. The most suitable framework is provided by Australian Bureau of Statistics census statistics. These statistics provide considerable detail about the engineering labour market and how it has changed over time. Engineering is just 2½% of the Australian labour force and women are just 11% of engineers. Consequently, the usual ABS sample surveys are limited in what they can say about engineering. The timing of this report coincides with a unique opportunity to benchmark the survey results on changes in the engineering labour market between the 2006 and 2011 censuses. This capacity has not previously been available and its strength lies in being able to comprehensively reflect on the gender imbalance in engineering and the utilisation of trained engineers in engineering.

### Labour Market Issues

Table 1.1 deals with labour market issues. The Table has two panels; the top panel provides statistics from the 2006 census and the bottom panel provides corresponding statistics from the 2011 census. Each panel shows statistics for employment (measures the demand for engineers), the labour force (measures the supply of engineers), unemployment (measures how well supply is being utilised) and the engineering population or potential supply. Each panel also provides statistics for the participation rate (measures how potential translates into actual supply of engineers), and the proportion of the supply of engineers employed in engineering work. These measures are included for men and women, and for Australian and overseas born individuals and give a comprehensive overview of the structure of the engineering labour market and how it changed between census years.

### The Supply of Engineers

The supply of engineers is measured by the labour force which is connected to potential supply (measured by the engineering population) by the participation rate. The engineering population is that segment of the Australian population that possesses formal qualifications in

<sup>8</sup> The more important references include *The Engineering Profession: A Statistical Overview*, Ninth Edition, 2012, *Women in Engineering, A Statistical Update*, May 2012, *The Engineering Profession in Australia; A Profile from the 2006 Population Census* and *The Engineering Labour Market: An Overview for 2012*.

## Working Environment and Engineering Careers

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engineering recognised by Engineers Australia for membership. In 2006, there were 28,291 women in the engineering population, 11.5% of the total. Overall labour force participation was 81.7%, but was higher for men (82.6%) than for women (74.8%). This gender gap was particularly high for overseas born engineers. The participation rate for Australian born women was 80.1%; lower than for men, but higher than for overseas born women for whom it was 71.6%. These differences point to factors that deter women, particularly overseas born women, from participation in the labour market.

**Table 1.1: Comparing the Engineering Labour Markets in the 2006 and 2011 Censuses**

**2006 Census**

Labour force status	Australian Born			Overseas Born			Engineering Team		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Employed FT	79915	5794	85709	68051	8365	76416	147966	14159	162125
Employed PT	9041	1954	10995	9864	2830	12694	18905	4784	23689
Employed away	4323	558	4881	3297	578	3875	7620	1136	8756
TOTAL EMPLOYED	93279	8306	101585	81212	11773	92985	174491	20079	194570
Unemployed (FT)	1309	108	1417	2421	499	2920	3730	607	4337
Unemployed (PT)	330	87	417	897	394	1291	1227	481	1708
TOTAL UNEMPLOYED	1639	195	1834	3318	893	4211	4957	1088	6045
LABOUR FORCE	94918	8501	103419	84530	12666	97196	179448	21167	200615
Not in labour force	18871	2107	20978	19021	5017	24038	37892	7124	45016
ENGINEERING POPULATION	113789	10608	124397	103551	17683	121234	217340	28291	245631
Participation Rate (%)	83.4	80.1	83.1	81.6	71.6	80.2	82.6	74.8	81.7
Unemployment Rate (%)	1.7	2.3	1.8	3.9	7.1	4.3	2.8	5.1	3.0
Employed in Engineering	65973	4970	70943	46313	5002	51315	112286	9972	122258
% in Engineering	69.5	58.5	68.6	54.8	39.5	52.8	62.6	47.1	60.9

**2011 Census**

Employed FT	92614	6785	99399	98910	13214	112124	191524	19999	211523
Employed PT	11103	2807	13910	13772	4651	18423	24875	7458	32333
Employed away	4776	794	5570	4148	941	5089	8924	1735	10659
TOTAL EMPLOYED	108493	10386	118879	116830	18806	135636	225323	29192	254515
Unemployed (FT)	1888	156	2044	3815	1001	4816	5703	1157	6860
Unemployed (PT)	485	120	605	1291	619	1910	1776	739	2515
TOTAL UNEMPLOYED	2373	276	2649	5106	1620	6726	7479	1896	9375
LABOUR FORCE	110866	10662	121528	121936	20426	142362	232802	31088	263890
Not in labour force	22867	2476	25343	25418	7872	33290	48285	10348	58633
ENGINEERING POPULATION	133733	13138	146871	147354	28298	175652	281087	41436	322523
Participation Rate (%)	82.9	81.2	82.7	82.8	72.2	81.0	82.8	75.0	81.8
Unemployment Rate (%)	2.1	2.6	2.2	4.2	7.9	4.7	3.2	6.1	3.6
Employed in Engineering	78290	6636	84926	69710	9276	78986	148000	15912	163912
% in Engineering	70.6	62.2	69.9	57.2	45.4	55.5	63.6	51.2	62.1

Source: Compiled using the ABS TableBuilder Pro Facility

The supply of women engineers in 2006 was 21,167 or 10.6% of the total of 200,615. This lower share was due to the lower participation rate for women. There were 8,501 Australian born women and 12,666 overseas born women in the supply of engineers resulting in shares of 8.2% and 13.0% of supply in the two components respectively.

By the time of the 2011 census, the engineering population had increased to 322,523 or by 31.3%. The overall participation rate was only slightly higher than in 2006 but the participation rates for women and overseas born engineers had increased while the participation rate for Australian born men fell. The increases in women's participation rates contributed to higher growth in the supply of women engineers. In 2011, the women's share of the supply of engineers was 11.8%, up from 10.6%.

The supply of engineers in Australia increased by 63,275 or 31.5% between census years. This was equivalent to compound growth of 5.6% per annum. The supply of women

engineers increased by 9,921 or 46.9% to 31,088 with much higher compound growth of 8.0% per annum. A key driver of growth in the supply of women engineers was skilled migration; Australian born women accounted for 2,161 or 21.8% of the increase and overseas born women 78.2% of the increase. This is reflected in compound growth rates of 4.6% per annum and 10.0% per annum respectively.

### The Demand for Engineers

The demand for engineers is measured by employment. The pattern of changes in demand between the census years generally was similar to the one described for supply but on a smaller scale with consequences for unemployment. The overall increase in the demand for engineers was 59,945 or 30.8%, equivalent to compound growth of 5.5% per annum. The increase in demand for women engineers was 9,113 or 45.4%, equivalent to compound growth of 7.8% per annum. The demand for Australian born women engineers increased by 2,080 or 25.0%, equivalent to compound growth of 4.6% per annum while the increase in demand for overseas born women was 7,033 or 59.7%, equivalent to compound growth of 9.8% per annum.

In the 2006 census, the incidence of part time work in engineering was substantially lower than in other fields that insist on comparable qualifications, especially among women; 88.3% of engineers worked full time and 12.7% worked part time. The incidence of part time work was much higher among women (25.3%) than men (11.3%). There was little difference in the incidence of part time work between Australian born women (25.2%) and overseas born women (25.3%) but there was a higher incidence of part time work among overseas born men (12.7%) than Australian born men (10.2%).

In the 2011 census, the proportion of full time work had fallen slightly (to 86.7%) and the proportion of part time work had increased (to 13.3%). The latter affected both men and women but was particularly noticeable for women; the proportion of men working part time increased from 11.3% to 11.5% and for women from 25.3% to 27.2%. The increase in part time work was particularly high for Australian born women; 25.2% in 2006 to 29.3% in 2011 compared to 25.3% to 26.0% for overseas born women.

### Unemployment

Slower growth in the demand for engineers compared to supply meant that the unemployment of engineers increased from 3.0% in 2006 to 3.6% in 2011. To put these figures into perspective the equivalent general unemployment rates in the Australian labour market were 5.2% and 5.6% respectively. In 2006, unemployment rates were higher for women than for men (5.1% compared to 2.8%) and for overseas born engineers than Australian born (4.3% compared to 1.8%). The rate for Australian born women was 2.3% and for overseas born women it was 7.1%. This pattern was repeated in 2011.

In 2011, the unemployment rate for women engineers was 6.1% compared to 3.2% for men. The gap remained small for Australian born engineers; 2.1% for men and 2.6% for women. However, both rates and the gender gap were larger for overseas born engineers; 4.2% for men and 7.9% for women.

Economists regard unemployment rates in the vicinity of 2½ to 3% as frictional unemployment, the short periods of unemployment associated with movements of people between jobs. In the light of differences in demand for, and supply of, engineers in the various engineering specialisations, engineering experience and skill levels and geographic regions, aggregate frictional unemployment for engineers could be fractionally higher. The overall rate of unemployment in 2011, 3.6%, can be viewed this way, but rates of 5% and higher at a time of engineering skill shortage are not and are symptomatic of wider problems.

### Employment in Engineering

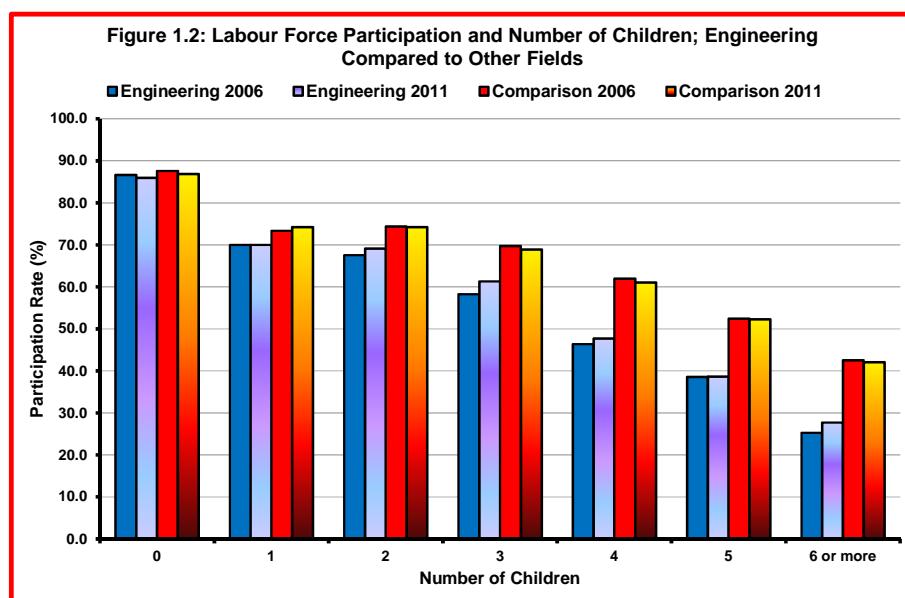
Research by Engineers Australia estimated that, in 2006, 60.9% of the supply of engineers actually worked in engineering occupations<sup>9</sup>. The proportion was generally lower for women and for overseas born engineers. Overall 47.1% of the supply of women engineers worked in engineering compared to 62.6% of men. The difference was more stark between Australian and overseas born engineers; among Australian born engineers, 69.5% of the supply of men worked in engineering compared to 58.5% of women and among overseas born engineers, 54.8% of the supply of men worked in engineering compared to 39.5% of women.

These patterns were repeated in 2011, but generally the proportions of supply employed in engineering were higher than in 2006. Overall, 62.1% of the supply of engineers was employed in engineering; for men the proportion was 63.6% and for women it was 51.2%. Among Australian born engineers, 70.6% of the supply of men was employed in engineering compared to 62.2% of women. Among overseas born engineers, 57.2% of the supply of men was employed in engineering compared to 45.4% of the supply of women.

In occupations where registration is mandated, such as in health, the proportion of supply employed in the field of qualification can be as high as 80%. Registration is not required to practice as an engineer and part of the lower proportion of supply working in engineering can be explained this way. However, it is improbable that this can explain the low figures for women, particularly overseas born women and other explanations need to be found.

### Children and Family Responsibilities

Surveys have suggested that labour force participation is adversely affected by family responsibilities<sup>10</sup>. Demonstrating career progression is difficult without access to longitudinal statistics; however, careers are unlikely to progress when women no longer participate in the labour market in order to look after their children. In this sense, the number of children can be used to measure the relationship between family responsibilities and labour force participation. Census statistics can be used to demonstrate the nature of this relationship and to assess whether engineering is similar to or different to other fields in this respect.



<sup>9</sup> Engineers Australia, The Engineering Profession, op cit

<sup>10</sup> See for example APESMA, Women in Professions Survey Report, 2009-10, "71% of those with carer (for children) responsibilities said that this had affected their career progression", page 3, [www.apesma.asn.au](http://www.apesma.asn.au)

Figure 1.2 illustrates labour force participation rates for women with no children and women with one or more children. Several sets of estimates are included in the diagram; the 2006 census is compared to the 2011 census and in each case engineering is compared to other professions with the requirement that the same level of qualifications are necessary.

Labour force participation rates for women with no children are very high, irrespective of field and have changed very little between the 2006 and 2011 censuses. The level of participation exceeds 86% and is higher than the participation rates for Australian born men in either census. Labour force participation falls with the number of children and the reduction in participation is greater in engineering than in other fields and the difference increases with the number of children. There are some small changes between the censuses but not enough to alter this conclusion. The implication of this result is that increases in family responsibilities (as measured by increases in family size) reduces labour force participation and reduces participation more in engineering than in other professions. This is indicative of conditions in engineering less conducive to family responsibilities than exist for other professions.

### 1.6 Key Points

Engineers are critical to innovation and productivity growth in an Australian future characterised by an aging demographic environment. At present, Australia is over-dependent on skilled migration with over 70% of the growth in the supply of engineers between the 2006 and 2011 censuses coming from skilled migration. Australia needs to do more to become less dependent on this source.

The two key factors impeding higher domestic growth in the supply of engineers are the male dominance of engineering and the retention of trained engineers in engineering. Increasing the retention of trained engineers in engineering can assist in easing skill shortages by making better use of resources already in the system, whether men or women. Increasing the participation of women in engineering is also essential to meet community social expectations, to take advantage of the large pool of talent that women offer and to maintain and, even raise, the standards of the engineering profession.

The survey results reported provide information that is important to workplace relations, job satisfaction and careers of engineers. The survey results reflect on the inter-relationship between work and family responsibilities of members of Engineers Australia and will assist the design of policies that will lead to increased retention of engineers in engineering, men and women, and will lead to increased participation of women in engineering as a career. Many of the issues canvassed in the survey affect men and women equally but in other cases there are clear cut gender differences that need to be resolved.

# 2 SURVEY PARTICIPANTS

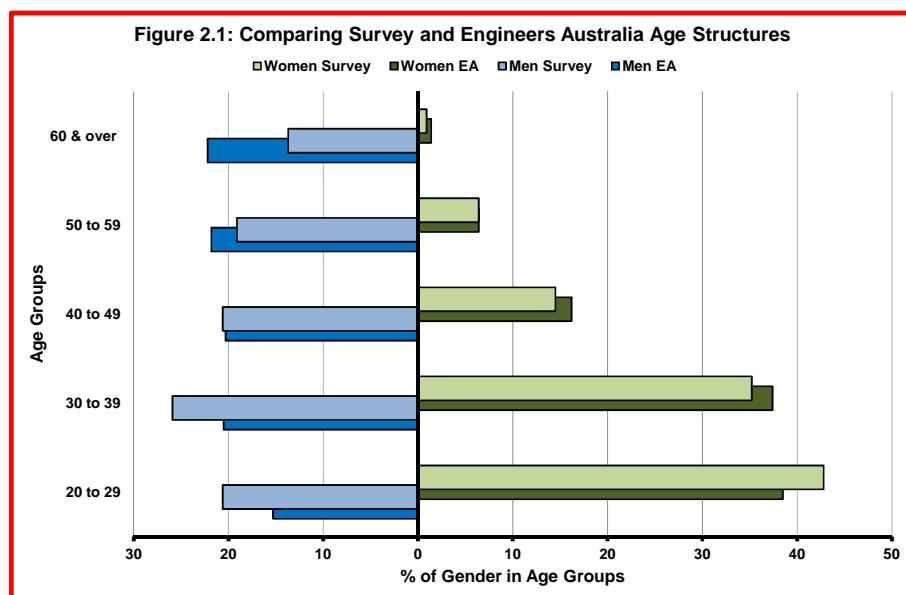
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This chapter reviews the structure and characteristics of survey participants to assist evaluation of the survey and to provide background information to evaluate survey results.

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## 2.1 Structure of Survey Response

One important aspect of the survey response has already been discussed; figure 1.1 demonstrates the different age structures between men and women. A related question is how the survey age structure compares to the age structure of Engineers Australia's members. Figure 2.1 illustrates the two age structures; the survey age structure is shown by the lighter coloured bars and Engineers Australia's age structure is shown by the darker bars.



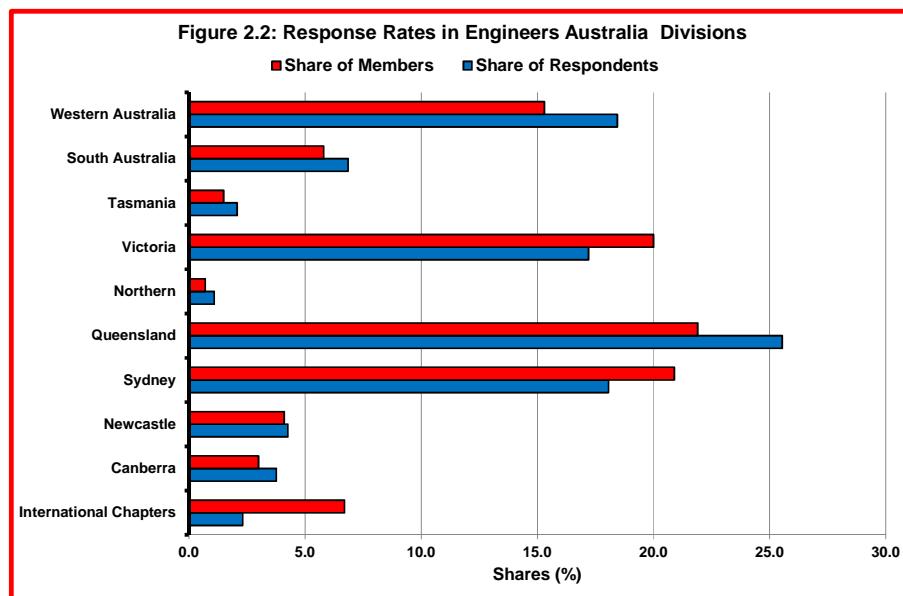
The survey was a reasonable representation of the age structure of Engineers Australia's women members. The survey over-represented the 20s age group, but this was offset by a similar under-representation in the 30s age group. The two groups combined cover 76% of members and 78% of survey responses. Responses in the 40s age group were slightly below the membership share, 14.5% compared to 16.2% of members. Responses in the 50s age group were identical to the share of members in this group and there was a small under-representation of older women, 0.9% of responses compared to 1.4% of members.

Survey participation by men was skewed towards younger age groups whereas membership is skewed towards older age groups, a result likely related to the use of an on-line survey. Responses in both the 20s and 30s age groups over-represent membership shares; in the 20s, 20.6% of responses compared to 15.3% of members and in the 30s, 25.9% of responses compared to 20.3% of members. The proportion of responses from men in the 40s age group is almost identical to their membership share, 20.6% compared to 20.3% of members. However, the two older age groups show increasing degrees of under-representation of men; in the 50s age group, 19.1% of responses compared to 21.8% of

members and in the 60 years and over group, 13.7% of responses compared to 22.2% of members.

**Table 2.1: Response Rates and Membership Structure**

Grade	Gender	
	Men	Women
<b>Professional</b>		
<b>Fellow</b>	<b>9.1</b>	<b>33.0</b>
<b>Member</b>	<b>9.6</b>	<b>22.0</b>
<b>Graduate</b>	<b>8.2</b>	<b>16.0</b>
<b>Sub-total</b>	<b>9.3</b>	<b>19.7</b>
<b>Technologist</b>		
<b>Fellow</b>	<b>40.7</b>	<b>0.0</b>
<b>Member</b>	<b>12.4</b>	<b>36.0</b>
<b>Graduate</b>	<b>6.4</b>	<b>9.1</b>
<b>Sub-total</b>	<b>11.5</b>	<b>27.8</b>
<b>Associate</b>		
<b>Fellow</b>	<b>9.0</b>	<b>0.0</b>
<b>Member</b>	<b>8.3</b>	<b>14.3</b>
<b>Graduate</b>	<b>6.4</b>	<b>42.3</b>
<b>Sub-total</b>	<b>7.8</b>	<b>25.8</b>
<b>Hon Fellows</b>	<b>9.2</b>	<b>20.0</b>
<b>Total</b>	<b>9.2</b>	<b>19.9</b>
<b>Overall Total</b>	<b>9.3</b>	<b>19.9</b>



Engineers Australia has a membership structure comprising three occupational groups and three grades of members in each group. Table 2.1 examines how the survey responses were distributed across the membership structure. The overall response rate for women was 19.9%. For women professional engineers, the response rate was almost identical at 19.7% but ranged from 16.0% for Graduates, to 22.0% for Members and 33.0% for Fellows. The response rate for women engineering technologists was 27.8% and for women associates engineers 25.8%. In both cases, these high figures reflect quite small member numbers, and this has resulted in the large variation in response rates for grades in these occupational

groups. For example, the two zero response rates for women are situations in where there are respectively no women and two women in those categories in Engineers Australia.

The overall response rate for men was 9.3%. The response rates for the occupational groups were 9.3% for professional engineers, 11.5% for engineering technologists and 7.8% for engineering associates. Grade variation was quite small for professional engineers and associate engineers but much higher for engineering technologists where membership numbers are relatively small.

Figure 2.2 considers the geographic distribution of survey participants by comparing response rates in Engineers Australia Divisions to membership shares. The survey over-represents membership in several Divisions; Queensland (25.5% of respondents compared to 21.9% of members), Western Australia (18.4% of respondents and 15.3% of members), Newcastle (4.3% of respondents compared to 4.1% of members), Canberra (3.8% of respondents and 3.0% of members), South Australia (6.9% of respondents and 5.8% of members), Tasmania (2.1% of respondents compared to 1.5% of members) and Northern Division (1.1% of respondents and 0.7% of members). Other Divisions are under-represented to varying degrees; Sydney had 18.1% of respondents and 20.9% of members; Victoria had 17.2% of respondents and 20.0% of members and the largest under-representation was from the International Chapters with 2.3% of respondents and 6.7% of members.

Taking into account membership structure, membership age structure, the geographic distribution of members and the high response rates, the survey was a comparatively good representation of Engineers Australia's membership.

## **2.2 Qualifications**

Engineers Australia's members have become better qualified in engineering compared to 2007. Table 2.2 shows the engineering qualifications held by 2012 survey participants by gender and age.

**Table 2.2: The Highest Engineering Qualifications Held by Survey Participants (%)**

**Men**

Qualification	Age Group (years)						Total*
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	
Doctorate	0.4	4.2	4.6	5.3	6.3	15.6	4.2
Masters	8.9	24.3	25.5	23.7	23.4	20.0	21.0
Other Postgraduate	2.5	4.3	10.1	13.0	10.9	8.1	7.6
Bachelors	87.4	65.1	54.3	49.3	44.5	35.6	61.4
Associate/Advanced Diplomas & Other	0.8	2.0	4.9	7.5	12.0	15.6	4.8

**Women**

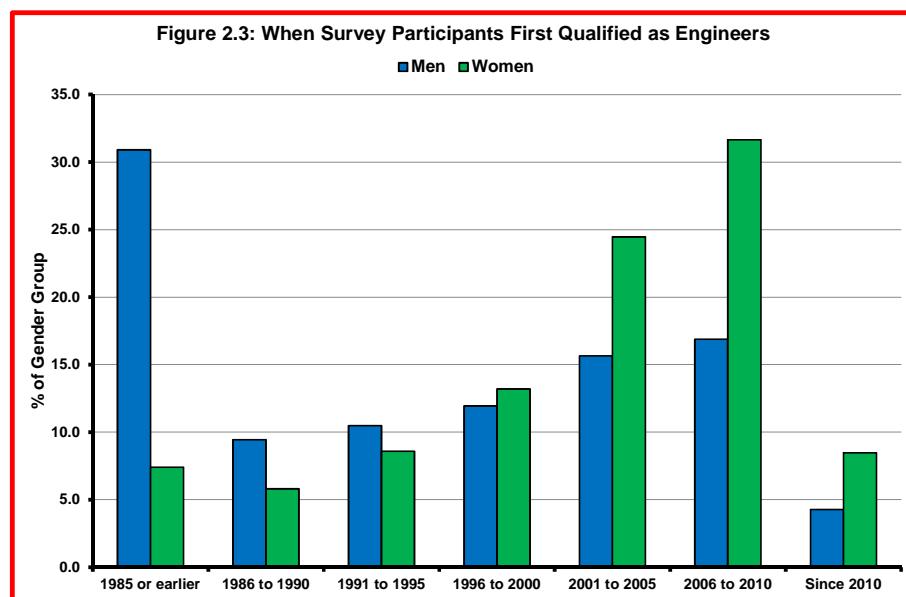
Doctorate	0.5	5.5	6.7	16.9	12.5	0.0	4.3
Masters	8.3	27.8	28.9	28.8	62.5	0.0	19.9
Other Postgraduate	2.5	5.8	8.9	11.9	0.0	0.0	5.2
Bachelors	88.3	60.2	53.3	39.0	25.0	100.0	69.7
Associate/Advanced Diplomas & Other	0.5	0.6	2.2	3.4	0.0	0.0	1.0

The proportion of men and women with doctorates is almost identical at 4.2% and 4.3% respectively, up from 2.8% in both cases in 2007. The proportion of doctoral qualifications

increases with age. The higher proportions of women in the 40s and over age groups are associated with smaller numbers, influencing the aggregate share.

In 2007, 9.1% of men and 13.3% of women held masters degrees in engineering with a further 1.7% and 1.9% respectively holding postgraduate diplomas or certificates. The 2012 figures are much higher; 21.0% of men and 19.9% of women held masters degrees and 7.6% of men and 5.2% of women held postgraduate diplomas or certificates. These differences explain why the proportion of men and women whose highest qualification in engineering is a bachelors degree is lower in 2012 than in previous years. In 2007, 83.6% of men and 80.0% of women were in this position but in the 2012 survey, these figures fell to 61.4% of men and 69.7% of women. The Table clearly shows that these proportions change with age; the proportion of postgraduate qualifications increases with age while the proportion of bachelors degrees falls.

The final point to note in Table 2.2 concerns the qualifications of associate engineers. The proportion of women with these qualifications is lower than men, but in both genders the proportions are higher in older age groups. This is consistent with the increasing popularity of bachelors degrees as the entry level qualification and falling popularity of associate degrees and advanced diplomas evident in education statistics. This difference contributes to a statistical significant difference in qualifications between men and women indicating that women are more likely than men to be degree qualified<sup>11</sup>.



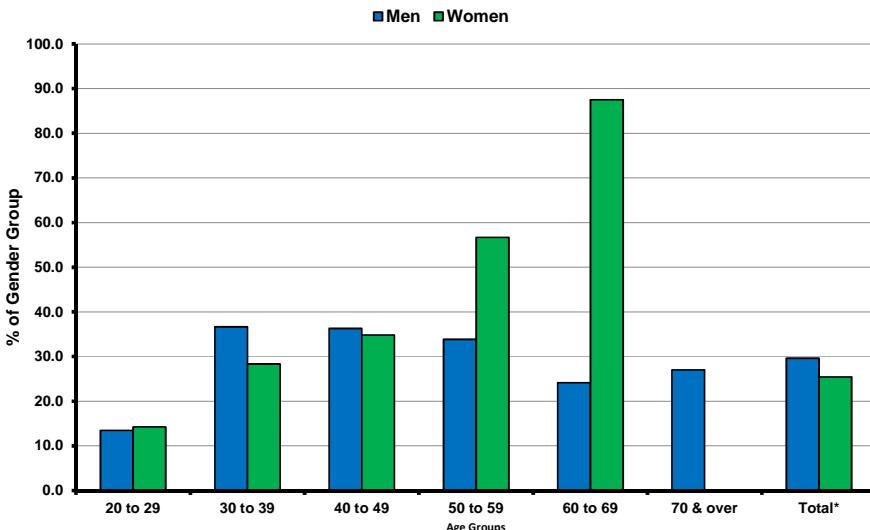
Proportionally more women are recent graduates and proportionally more men graduated as engineers prior to 1985. Almost two-thirds of women graduated as engineers since 2001 and 8.9% since 2010 compared to 37.2% since 2001 and 4.7% since 2010 for men respectively. In contrast, 30.9% of men first graduated as engineers before 1985 compared to just 7.4% of women.

Australian Government policy to address engineering skill shortages has relied on skilled migration. Figure 2.4 examines how skilled migration influences survey results. Overall, 29.6% of men and 25.4% of women first qualified as engineers overseas. These proportions are substantially lower than census statistics examined in Chapter 1 suggest. The proportions of overseas trained engineers is particularly low in the 20s age group and then broadly

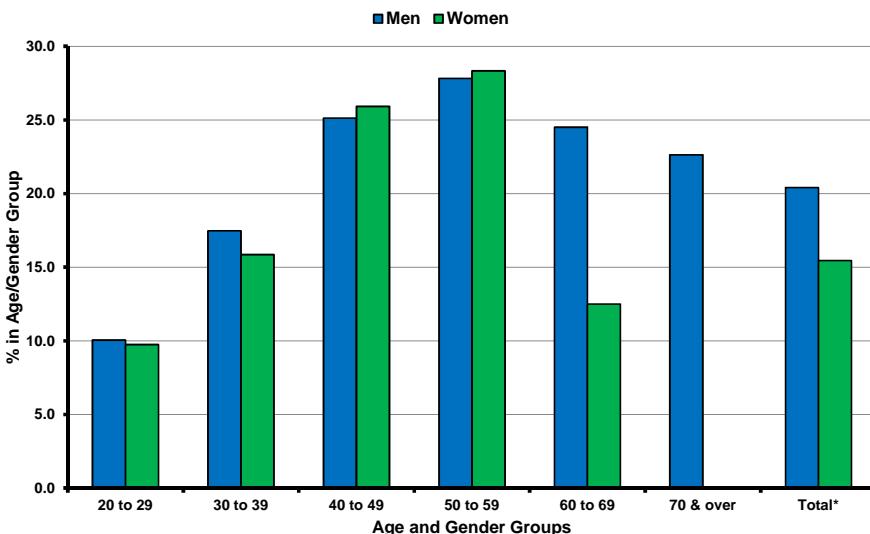
<sup>11</sup> The  $\chi^2$  was 5.05 and was significant at the 5% level with 1 df.

increases with age group until the 40s. The large share of overseas trained women in the 50s and 60s age group is reflective of a wave of higher immigration of women engineers in earlier decades.

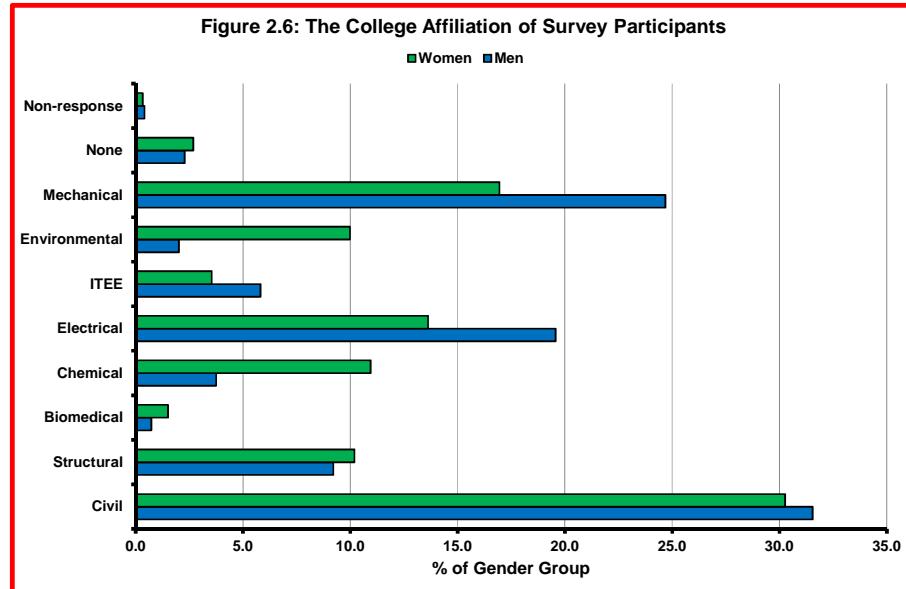
**Figure 2.4: Survey Participants Who First Qualified as Engineers Overseas**



**Figure 2.5: Post Graduate Qualifications in Fields Other than Engineering**



Many engineers complement their engineering studies with postgraduate qualifications in another field. In 2007, 17.7% of men and 16.4% of women indicated that they had post graduate qualifications in a field other than engineering. In 2012 these figures were 20.4% for men and 15.5% for women and Figure 2.5 shows that these proportions increased with age, peaking in the 50s age group. There was little, if any, gender difference but the pattern in Figure 2.5 is consistent with career progression and experience. Management was by far and away the most popular choice of alternative field; 62.7% of men and 47.2% of women indicated they held postgraduate qualification in management. Qualifications in science were held by 11.3% of men and 18.1% of women; in accounting or economics by 5.5% of men and 6.3% of women and in education by 2.6% of men and 2.8% of women. Other unspecified courses were completed by 17.9% of men and by 25.7% of women.



## **2.3 College Affiliation**

Members of Engineers Australia can affiliate with more than one College but the survey considered only survey participants' main College affiliation. Figure 2.6 shows the distribution of responses. The proportion of men was higher than women in four Colleges; Civil (31.6% of men compared to 30.3% of women; Electrical (19.6% of men compared to 13.6% of women), ITEE (5.8% of men compared to 3.5% of women) and Mechanical (24.7% men compared to 17.0% of women). Conversely, the proportion of women respondents was higher than men in four Colleges; Structural (10.2% women compared to 9.2% men); Biomedical (1.5% of women compared to 0.7% of men); Chemical (10.9% of women compared to 3.7% of men) and Environmental (10.0% of women compared to 2.0% of men). A small proportion of respondents indicated no College affiliation (2.3% of men and 2.7% of women).

## **2.4 Key Points**

The purpose of this chapter was to explore the structure and characteristics of survey respondents to evaluate whether the outcome was representative of Engineers Australia's membership. Taking into account membership structure, age structure, geographic distribution and the high response rates, the survey was a good representation of Engineers Australia's membership. Although, a structured survey is always preferable, the present survey provides a satisfactory platform to explore members' views.

The survey showed that members of Engineers Australia have become better qualified; first and foremost, in engineering with more members holding postgraduate qualifications in engineering, and secondly, through the completion of postgraduate courses in management and several other fields. The results show that degree qualified engineers are more prevalent in younger age groups and among women and that associate engineers are more male oriented and more concentrated in older age groups.

Skilled migration accounted for over 70% of the increase in the supply of engineers between the 2006 and 2011 censuses. However, less than 30% of survey participants obtained their engineering qualifications overseas. This result stands out as a key issue that requires further investigation.

There were some differences between the college affiliations of men and women. The representation of women was proportionally higher in the Chemical, Biomedical and Environmental Colleges and the representation of women was proportionally lower in the Electrical and Mechanical Colleges.

# 3 JOB PARAMETERS

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This chapter examines the parameters that characterise the jobs in which survey participants worked. Issues considered were labour force status, the nature of jobs held by participants, the type of organisation they were employed in and which industry it was in, hours worked and whether all hours worked were paid, participant salaries and the degree of their attachment to their present jobs. These are parameters common to most jobs but how they apply in particular cases determines the working environment.

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## 3.1 Labour Force Status

Census statistics show that in engineering employment is very high and unemployment low. The labour force status of survey participants, shown in Table 3.1, conforms to this pattern with two key differences. Labour force participation rates in the survey (96.6% for men and 99.6% for women) are higher than in the census statistics (82.6% for men and 74.8% for women) and unemployment rates are lower (2.0% for men and 2.2% for women compared to 3.2% and 6.1% respectively). These differences suggest a close tie between membership of Engineers Australia and high labour market participation and employment. The second difference is that the incidence of part time employment in the survey for both men and women was about half that shown by census statistics. These outcomes are consistent with 2007 findings.

Table 3.1: The Labour Force Status of Survey Participants

### Men

Labour Force Status	Age Group (years)						
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	Total*
Employed FT	93.8	93.3	93.2	89.9	60.6	17.5	87.1
Employed PT	0.5	1.3	1.6	4.1	20.6	20.4	4.4
Unemployed seeking FT	1.4	1.3	2.2	1.9	1.2	1.5	1.6
Unemployed seeking PT	0.1	0.1	0.1	0.2	1.1	1.5	0.3
Age Retirement	0.0	0.0	0.0	0.4	9.6	47.4	2.4
Other Retirement	0.1	0.0	0.1	0.8	4.1	6.6	0.8
Non-response	4.1	4.1	2.8	2.7	2.8	5.1	3.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

### Women

Employed FT	92.5	75.6	74.1	73.3	50.0	100.0	82.3
Employed PT	3.3	18.9	21.5	16.7	37.5	0.0	12.6
Unemployed seeking FT	0.8	1.5	2.2	5.0	0.0	0.0	1.5
Unemployed seeking PT	0.0	1.2	1.5	0.0	0.0	0.0	0.6
Age Retirement	0.0	0.0	0.0	0.0	12.5	0.0	0.1
Other Retirement	0.0	0.6	0.0	1.7	0.0	0.0	0.3
Non-response	3.5	2.1	0.7	3.3	0.0	0.0	2.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Although reported part time work in the survey was lower than expected, the structure of labour force status is quite different between men and women. For the survey as a whole, the difference was statistically significant at the 1% level<sup>12</sup>. Table 3.1 shows that labour force status changes with age for both men and women and chi-squared statistics were estimated

<sup>12</sup> The  $\chi^2$  for the total of men and women was 18.84 with 1 df and for age groups they were 16.79, 263.38, 269.92 and 48.27 for the 20s, 30s, 40s and 50s age degrees with 1 df in each case.

to test for gender differences in age groups up to 50 years. These statistics all proved to be significant at the 1% level.

The survey did not explore whether participants, particularly women, would prefer more part time work opportunities. The low incidence of part time work in the survey and the pronounced change for women between the 20s and 30s age groups appear to point in this direction, but additional research is necessary to confirm this view.

## **3.2 The Nature of Employment**

The predominant form of employment of survey participants was in a permanent salaried position working either full time or part time. Table 3.2 shows that 84.3% of men and 91.8% of women were employed in salaried positions. Very few survey participants were employed in casual salaried positions; only 1.6% of men and 0.8% of women. Instead of casual employment, contract work was more prevalent for 6.5% of men and 4.9% of women. Men (7.5%) were more likely to be the owner/operators of their own businesses than women (2.4%).

The nature of employment changes with age group. The incidence of permanent salaried employment generally falls with age for both men and women. Casual work is less prevalent in younger age groups and more prevalent in older age groups. The incidence of contract work generally increases with age and is particularly high for men over 50 years of age.

**Table 3.2: The Nature of Employment**

**Men**

Type of Employment	Age Group						All Ages
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	
Permanent Salaried Position	95.0	92.6	83.7	79.8	57.1	25.0	84.3
Casual Salaried Position	0.9	0.7	1.1	1.2	6.0	4.8	1.6
Contract Position	3.7	3.9	5.8	9.8	12.5	19.6	6.5
Business Owner/Operator	0.3	2.8	9.3	9.1	23.4	46.4	7.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Women**

Permanent Salaried Position	96.4	92.0	82.3	88.0	57.1	0.0	91.8
Casual Salaried Position	0.3	0.7	0.8	6.0	0.0	0.0	0.8
Contract Position	2.8	5.9	8.1	2.0	42.9	0.0	4.9
Business Owner/Operator	0.6	1.4	8.9	4.0	0.0	100.0	2.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Employment as an owner/operator of a business is a feature of respondents aged 40 years and over. Among men, owner/operators are over 9.0% of employment in the 40s and 50s age groups, increasing to 23.4% in the 60s age group and to 46.4% in the 70 years and over age groups. The equivalent statistics for women suffer because of small numbers in the over 50s age groups. However, it is worth noting that women in the 40s age group are almost as likely to be an owner/operator of a business as men.

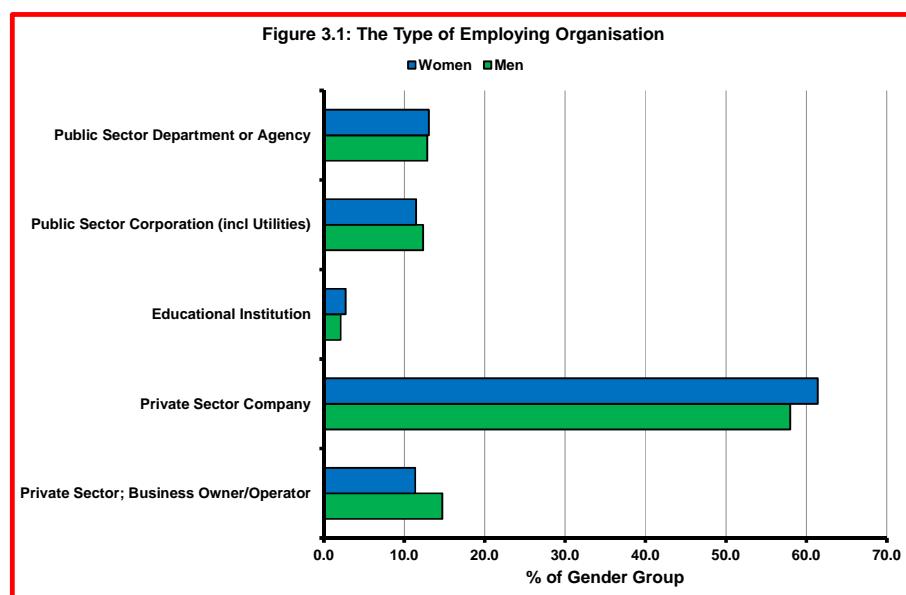
The apparent gender difference in the distribution of different types of jobs produced a chi-squared statistic that was statistically significant at the 5% level, but this result was difficult to replicate by age group. Chi-squared statistics estimated for the 20s, 30s and 40s age groups showed that these distributions were not statistically different. However, the distributions for the 50s age group was statistically significant at the 1% level<sup>13</sup>. Since there were only 60 women in this age group, this result may be due to the stage of development that women

<sup>13</sup> The  $\chi^2$  was 29.63 and was significant at the 1% level with 1 df.

engineers are at and that over time the similarities between men and women in younger age groups may become more evident in older age groups as well.

### **3.3 The Type of Employing Organisation**

Almost three-quarters of survey participants were employed in the private sector; the majority in companies as employees (58.0% of men and 61.4% of women) and the remainder (14.7% of men and 11.4% of women) as owner/operators of private sector businesses. There was some ambiguity concerning business owner/operators between the responses in Table 3.3 and the responses in Table 3.2; the former show higher statistics for owner/operators. Public sector employment was also very important to survey participants; in each gender 27.2% of employment was in the public sector with slight differences in the type of agency.



**Table 3.3: The Type of Employing Organisation**

Employing Organisation	Age Group						All Ages
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	
Private Sector; Business Owner/Operator	11.1	13.3	15.2	15.2	19.4	29.4	14.7
Private Sector Company	64.5	64.1	57.6	52.0	48.8	34.9	58.0
Educational Institution	0.7	1.2	1.6	2.5	5.4	8.7	2.1
Public Sector Corporation (incl Utilities)	13.6	9.7	12.1	13.6	13.6	14.3	12.3
Public Sector Department or Agency	10.1	11.7	13.5	16.7	12.9	12.7	12.8
<b>Women</b>							
Private Sector; Business Owner/Operator	9.7	11.5	14.6	14.0	12.5	0.0	11.4
Private Sector Company	70.5	59.7	53.1	33.3	37.5	100.0	61.4
Educational Institution	0.3	2.6	2.3	19.3	12.5	0.0	2.7
Public Sector Corporation (incl Utilities)	10.8	11.8	13.8	7.0	12.5	0.0	11.5
Public Sector Department or Agency	8.7	14.4	16.2	26.3	25.0	0.0	13.0

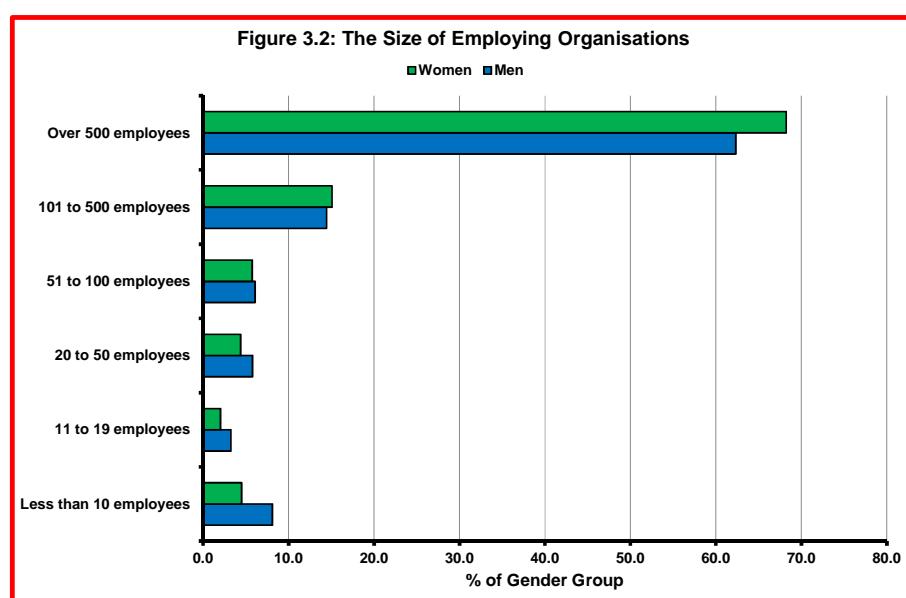
Table 3.3 shows how the type of employing organisation changes with age group. The proportion of private sector business owner/operators increases with age, more so among men than women. The proportion of employment in private sector companies falls with age. The proportion of public sector employment (combining the three types of organisations) increases with age.

At the aggregate level and in the 20s, 30s and 40s age groups, there were no statistical differences between men and women in the distribution of employment by organisation type.

However, a statistically significant difference was found in the 50s age group supporting the view that women were more likely to be employed in public sector agencies, including educational institutions, than men<sup>14</sup>.

### **3.4 The Size Employing Organisations**

The employment of survey participants was heavily concentrated in organisations with large numbers of employees; 78.7% of men and 83.3% of women were employed by organisations with at least 100 employees and 62.3% of men and 68.2% of women were employed by organisations with at least 500 employees. The remaining survey participants were employed in smaller organisations. The overall pattern is illustrated in Figure 3.2 and Table 3.4 shows how these distributions vary by age group.



**Table 3.4: The Size of Employing Organisations**

**Men**

Size	Age in years						
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	Total
Less than 10 employees	2.8	4.7	8.4	9.6	19.0	21.6	8.1
11 to 19 employees	4.3	4.4	2.8	2.1	1.7	3.2	3.3
20 to 50 employees	5.2	7.2	5.8	4.7	5.4	6.4	5.8
51 to 100 employees	5.9	6.7	5.6	6.3	5.0	6.4	6.1
101 to 500 employees	13.6	16.3	14.5	13.2	13.1	16.0	14.4
Over 500 employees	68.2	60.7	62.9	64.1	55.9	46.4	62.3
Total	100.0	100	100	100	100	100	100

**Women**

Less than 10 employees	2.4	3.5	10.9	8.8	0.0	100.0	4.5
11 to 19 employees	2.1	1.9	3.1	0.0	0.0	0.0	2.0
20 to 50 employees	4.0	4.1	7.0	3.5	0.0	0.0	4.4
51 to 100 employees	4.7	5.4	7.8	8.8	12.5	0.0	5.7
101 to 500 employees	15.3	16.6	14.7	8.8	12.5	0.0	15.1
Over 500 employees	71.5	68.5	56.6	70.2	75.0	0.0	68.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The two most evident changes with age were for organisations at the extremes of the size range. The proportion of employment in organisations with less than 10 employees increased with age group; just 2.8% of men and 2.4% of women aged in their 20s were employed by organisations of this size but substantially more in the 50s age group were employed by

<sup>14</sup> The  $\chi^2$  statistic was 127.33 and was significant at the 1% level with 1 df.

them: 9.6% of men and 8.8% of women. The proportion of employment in the largest organisations reduced with age group but there were some anomalies in this result in older age groups.

There was some weak evidence that suggests women are more likely to be employed in large organisations than men. At the aggregate level and for the 20s and 40s age group the gender distributions are not statistically different. However, in the 30s and 50s age groups, statistically significant differences at the 5% level were found<sup>15</sup>. These results are far from convincing and further investigation is warranted before firm conclusions are drawn.

### **3.5 Type of Engineering Work**

Survey participants were asked about the nature of their engineering work. In 2007, there was little difference between men and women in the mix of work undertaken; 56.7% of men indicated that their work had a managerial component, that is, it involved engineering management or a mixture of engineering management and technical work, compared to 52.2% of women. The results in 2012 are set out in Table 3.5 and show different results.

**Table 3.5: Type of Engineering Work Undertaken**

Men	Engineering Work Undertaken	Age in years						All Ages
		20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	
	Engineering management or supervision	12.7	23.7	38.9	37.5	36.3	34.9	29.0
	Engineering technical and/or design work	48.5	36.1	23.8	22.7	24.3	21.4	31.8
	A mixture of the two	38.8	40.2	37.3	39.8	39.4	43.7	39.2
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Women							
Engineering management or supervision	11.2	21.0	24.6	23.6	25.0	0.0	17.5
Engineering technical and/or design work	56.8	42.3	31.5	34.5	50.0	100.0	46.5
A mixture of the two	32.0	36.8	43.8	41.8	25.0	0.0	35.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

In 2012, 68.2% of men indicated that their engineering work had a management component, a substantially higher result than in 2007. This change was in marked contrast to the result for women; in 2012, 53.4% of women had a management component in their engineering work, a result slightly higher than in 2007 but well below the result for men.

Unlike in 2007 when no statistically significant gender difference was found, in 2012 a more complex situation was evident. The chi-squared statistic<sup>16</sup> testing for a difference at the aggregate level was statistically significant at the 1% level, suggesting that men had more management responsibilities than women. Chi-squared statistics were also calculated for each age group up to the 50s; no statistically significant results were found for the 20s and 30s age groups, but men in their 40s and 50s had statistically significant different work patterns compared to women in these age groups<sup>17</sup>. To retain more women in engineering, women engineers need more engineering management opportunities to overcome this difference.

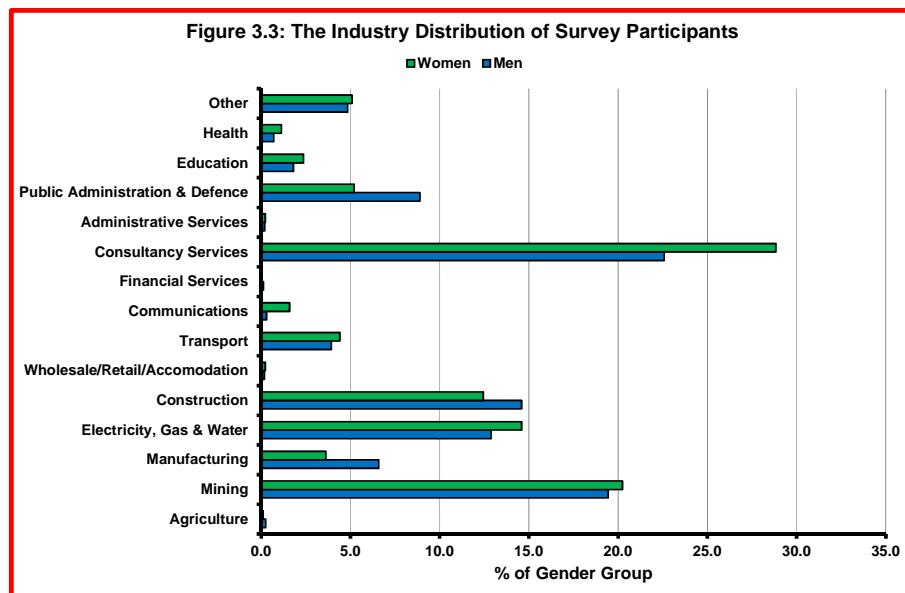
<sup>15</sup> The  $\chi^2$ 's were 4.26 for the 30s age group and 5.46 for the 50s age group and they were significant at the 5% level with 1 df.

<sup>16</sup>  $\chi^2$  was 11.67 with 1 df

<sup>17</sup> In the 40s age group  $\chi^2$  was 8.89 and in the 50s age group it was 11.41 with both significant at the 1% level

## **3.6 Industry of Employment**

The industry distribution of survey participants is illustrated in Figure 3.6. The largest concentrations of participants are in the mining, consultancy services, construction industries and in the major utilities. The major difference between the distribution in Figure 3.3 and census statistics relates to manufacturing; census statistics show that about 20% of the engineering labour force is employed in manufacturing compared to just 6.1% of survey participants.



The low absolute numbers of women engineers has already been noted, but it is useful to consider the proportional distributions of these women. Among survey participants the proportion of women engineers was higher than the proportion of men in six industries; consultancy services (28.8% of women compared to 22.6% of men), mining (20.2% of women compared to 19.4% of men), electricity, gas and water (14.6% of women compared to 12.9% of men), transport (4.4% of women compared to 3.9% of men), communications (1.6% of women compared to 0.3% of men) and education (2.4% of women compared to 1.8% of men). The proportion of men was higher than the proportion of women in public administration (8.9% of men compared to 5.2% of women), manufacturing (6.6% of men compared to 3.6% of women) and construction (14.6% of men compared to 12.4% of women).

## **3.7 Hours Worked & Paid**

This section explores hours worked and hours paid by survey respondents. Hours worked is widely regarded as a more useful characterisation of employment because individuals have different perceptions about what constitutes full time and part time work. When the statistics discussed in this section are compared to those in section 3.1, it becomes readily apparent that this issue arises in this survey. Using hours worked, men in the survey tended to under-estimate part time employment and women tended to over-estimate it.

The ABS framework of hours worked is used; part time work is between 1 and 34 hours worked per week and full time work is 35 hours or more hours worked per week. For ease of discussion a standard working week is treated as working between 35 and 40 hours per week. Figure 3.4 illustrates the distribution of hours worked per week by men and women overall. The distributions of hours worked for age groups are shown in Table 3.6.

Proportionally more women than men work a standard working week and proportionally more men than women work hours longer than a standard working week. Long hours appear to be the norm for men; 18.9% of men indicated that they worked 49 hours or more per week and 58.4% indicated that they worked in excess of 41 hours per week. The equivalent figures for women were 10.3% and 42.0% per week, respectively.

**Table 3.6: The Distribution of Hours Worked by Survey Participants (%)**

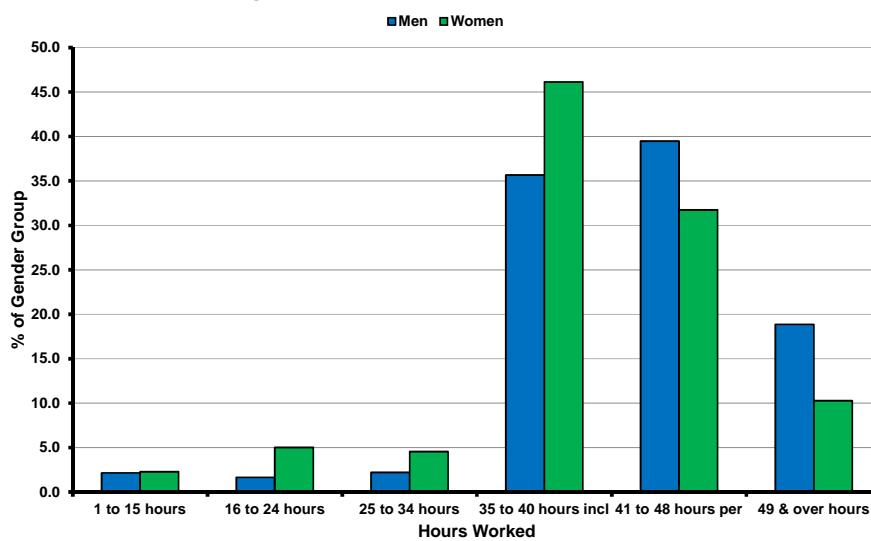
**Men**

Hours Worked Per Week	Age Group (years)						All Ages
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	
1 to 15 hours	0.6	1.0	1.0	2.2	8.6	22.8	2.2
16 to 24 hours	0.4	0.7	0.7	0.7	9.4	14.0	1.7
25 to 34 hours	0.6	0.4	1.7	2.1	8.3	29.8	2.2
35 to 40 hours incl	43.9	41.0	31.0	30.1	27.0	10.5	35.7
41 to 48 hours per	41.1	41.7	40.5	42.0	25.7	14.0	39.5
49 & over hours	13.4	15.1	25.0	22.9	21.1	8.8	18.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Women**

1 to 15 hours	1.3	2.3	2.4	7.5	14.3	0.0	2.3
16 to 24 hours	1.0	8.6	8.7	5.7	0.0	0.0	5.0
25 to 34 hours	2.6	4.7	10.3	3.8	14.3	0.0	4.6
35 to 40 hours incl	52.8	40.2	43.7	39.6	28.6	0.0	46.1
41 to 48 hours per	34.0	32.9	25.4	22.6	42.9	0.0	31.7
49 & over hours	8.2	11.3	9.5	20.8	0.0	100.0	10.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Figure 3.4: The Distribution of Hours Worked**



The distributions in Table 3.6 were investigated for statistically significant differences. The chi-squared statistics for the overall distribution of hours worked and for the first four age groups (up to the 50s) were each statistically significant at the 1% level<sup>18</sup>. These results indicate that women and men have different perceptions about the working week and these may have a bearing on attracting more women into engineering work.

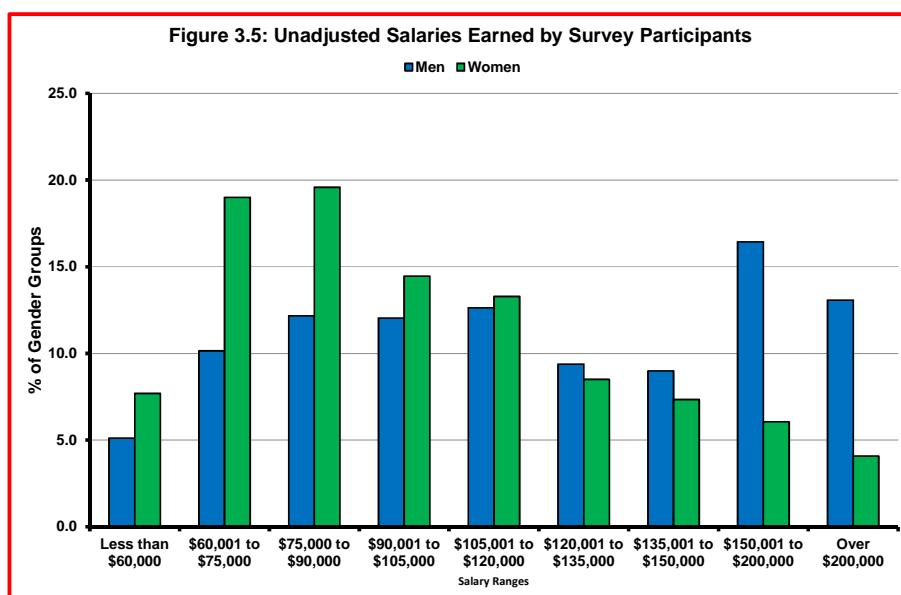
In the 2007 survey, respondents who worked part time hours indicated that they were paid for more hours than they worked while respondents who worked full time hours indicated that

<sup>18</sup> For the overall distributions the  $\chi^2$  was 17.87 and for the age groups they were 13.39 for the 20s, 136.81 for the 30s, 154.07 for the 40s and 63.23 for the 50s. All were significant at the 1% level.

they worked longer hours than they were paid. This pattern was repeated in the 2012 survey. Among men, 18.9% worked 49 hours or more but only 4.0% indicated that they were paid for these hours and 58.4% worked 41 hours or more but only 15.1% indicated they were paid for hours worked. The pattern was similar for women but reflective of the concentration of hours worked in the standard working week range; 10.3% of women worked 49 hours or more and 2.6% were paid for this, and 42.0% of women worked 41 hours or more per week while 10.1% were paid for this.

## **3.8 Salaries**

The 2007 survey reported statistically significant evidence of a salaries gap between men and women engineers. The income distributions used to support this conclusion is reproduced in Figure 3.5 using 2012 survey statistics. At face value, Figure 3.5 shows that there were more women earning lower incomes and more men earning higher incomes. Like in 2007, the differences illustrated were statistically significant at the 1% level<sup>19</sup>.



However, more women than men work part time and the age structure of women engineers is much younger than for men. Part time salaries are typically less than full time salaries and salary levels are generally related to experience. The survey did not examine respondents experience levels but other research has demonstrated that there is a close relationship between age and experience level<sup>20</sup>. These differences suggest a more complex situation than the one illustrated in Figure 3.5 needs to be considered before confirming a gender income gap.

The approach employed was to cross-tabulate hours worked and income for age and gender groups. Following cross-tabulation, the ABS definition of full time and part time work was used to group statistics. There were sufficient survey responses for comparison of full time and part time salaries between men and women in the 20s, 30s and 40s age groups. In the case of the 50s age group, numbers were sufficient to support comparison of full time salaries but not part time salaries. Chi-squared statistics were estimated for the comparisons mentioned and are summarised in Table 3.4.

<sup>19</sup> The  $\chi^2$  was 27.14 and was significant at the 1% level

<sup>20</sup> See the sections on Ages, Work Experience and Salary Packages in Engineers Australia, The Engineering Profession; A Statistical Overview, Ninth Edition, 2012, pp 75 to 83, [www.engineersaustralia.org.au](http://www.engineersaustralia.org.au)

**Table 3.7: The Gender Income Gap by Age & Hours**

Age Group	Employed Part Time	Employed Full Time
20 to 29 years	significant at 1%	not significant
30 to 39 years	significant at 1%	significant at 1%
40 to 49 years	significant at 1%	significant at 1%
50 to 59 years	na	significant at 1%

Table 3.7 shows that there was no difference in the income distributions of men and women employed full time and aged in their 20s. Apart from this similarity, women employed full time earn lower salaries than men in the 30s, 40s and 50s age groups. In each case the Chi-squared statistics were significant at the 1% level<sup>21</sup>. In part time employment, women earned lower salaries than men in the 20s, 30s and 40s age groups. The Chi-squared statistics for these results were significant at the 1% level<sup>22</sup>. The number of women aged in their 50s employed part time was too low to be reliable, but never-the-less; a Chi-squared statistic was calculated and was statistically significant at the 1% level.

Discounting this latter result, there is strong evidence that women engineers are paid lower salaries than men, irrespective of whether they work full time or part time and irrespective of age. The only clear exception to this conclusion was women in their 20s employed full time.

### 3.9 Attachment to Present Job

An important issue in modern labour markets is mobility. In engineering, mobility is a two-edged sword; mobility is essential for labour market efficiency, especially when there are skill shortages, but mobility of engineers is not always from one engineering job to another. Engineering training and skills are highly prized in jobs that require problem solving skills and analytical abilities. Consequently, weak attachment to present jobs can be viewed as a risk factor for the retention of engineers in engineering jobs.

Survey participants were asked about their intentions in respect to their present jobs over the next twelve months and Table 3.8 gives the responses by gender and age. Survey participants who are “very unlikely” or “unlikely” to leave their present job in the next twelve months can be said to have a strong attachment to their present job. The striking feature of the results is that only 60.4% of men and 58.1% of women have a strong attachment to their present jobs. Fewer men in their 20s and 30s were strongly attached to their present jobs but the degree of attachment increased beyond these age groups. There was a different pattern for women; 60.3% of women in their 20s were strongly attached to their present job but the proportions fell sharply in the 30s and 40s age groups (to 55.7% and 54.1% respectively) before increasing in later age groups.

Participants who are “likely” or “very likely” to leave their present jobs can be said to have a weak attachment to their job. Undecided respondents can go either way depending on the circumstances of the working environment. The survey results indicate that 21.1% of men and 25.2% of women are weakly attached to their present jobs. In both cases the proportion of weak attachment is highest in the 30s age group; for men 23.9% and for women 29.5%. Above this age group the proportions weakly attached are below the aggregate figures and falling.

<sup>21</sup> The  $\chi^2$  were 8.07 for the 30s age group, 25.43 for the 40s age group and 51.49 for the 50s age group.

<sup>22</sup> The  $\chi^2$  were 82.46 for the 20s age group, 53.44 for the 30s age group and 46.77 for the 40s age group.

## Working Environment and Engineering Careers

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**Table 3.8: The Attachment of Survey Respondents to their Present Jobs**

**Men**

Likelihood of leaving	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	All ages
Very unlikely	24.7	25.0	32.3	36.5	38.2	37.9	30.3
Unlikely	31.9	29.6	29.4	31.5	28.0	19.0	30.1
Undecided	20.7	21.8	18.0	14.3	14.4	22.4	18.5
Likely	14.8	16.1	11.8	11.8	11.1	17.2	13.6
Very Likely	7.9	7.5	8.5	5.8	8.2	3.4	7.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

**Women**

	27.5	25.2	24.6	34.0	42.9	100.0	26.8
Very unlikely	32.8	30.5	29.5	29.8	42.9	0.0	31.3
Unlikely	16.7	14.8	23.0	14.9	14.3	0.0	16.8
Likely	16.4	19.8	13.9	12.8	0.0	0.0	17.0
Very Likely	6.6	9.7	9.0	8.5	0.0	0.0	8.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

At the aggregate level and for the 20s, 40s and 50s age groups there were no statistical differences between men and women in their attachment to their present jobs. However, for the 30s age group women were less likely to have a strong attachment to their job and more likely to have a weak attachment than men<sup>23</sup>.

Survey participants who were “likely” or “very likely” to leave their present job in the next twelve months were asked to rank the reasons for such a decision. Fourteen possible reasons were offered and participants were asked to indicate their relative importance on a five point scale ranging from very important to very unimportant with a central neutral option. Table 3.9 shows the full set of responses. In this form the Table is difficult to analyse and the notion of “the weight of opinion” was used to simplify things. The weight of opinion was defined as the sum of “very important” and “important” less the sum of “unimportant” and “very unimportant.” The weight of opinion was used to construct Figure 3.6.

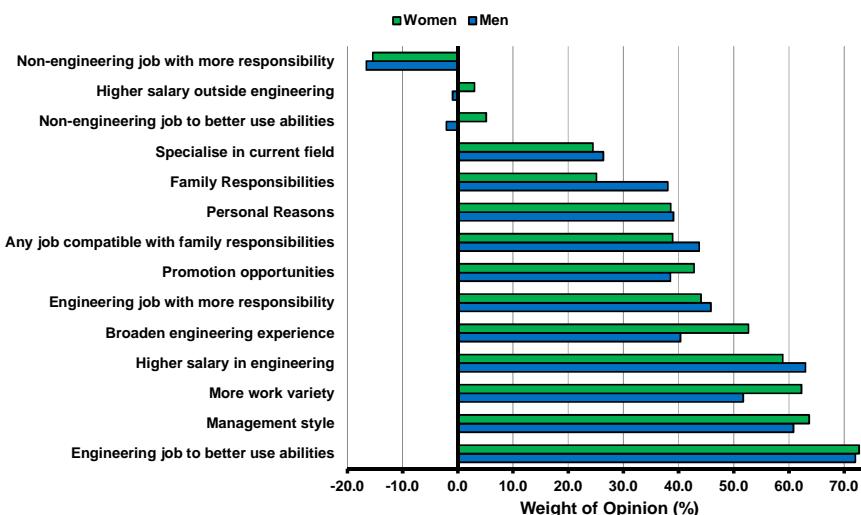
**Table 3.9: Reasons Why Respondents are Likely to Leave their Present Job Over the Next Twelve Months**

Reason	Very Important		Important		Neutral		Unimportant		Very Unimportant	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Broaden engineering experience	22.1	19.2	36.9	46.1	23.0	22.4	11.8	6.5	6.8	6.1
Specialise in current field	13.8	11.2	33.6	33.6	32.1	35.7	13.6	12.9	7.4	7.5
Higher salary in engineering	35.1	29.4	38.1	41.1	17.3	18.5	6.3	7.3	3.9	4.4
Higher salary outside engineering	13.0	12.4	20.2	21.5	33.4	36.9	18.2	16.3	16.0	14.6
Engineering job to better use abilities	38.6	39.4	41.2	40.6	13.2	14.5	4.2	4.4	3.6	2.8
Non-engineering job to better use abilities	11.6	14.2	23.9	21.9	27.5	34.8	20.3	18.0	17.3	12.9
Engineering job with more responsibility	19.3	20.6	39.7	36.6	28.7	29.6	7.9	9.5	5.2	3.7
Non-engineering job with more responsibility	7.2	6.2	18.9	15.9	31.8	42.3	22.5	18.9	20.1	18.5
Any job compatible with family responsibilities	25.0	30.3	34.9	28.3	25.0	22.5	8.7	10.7	7.4	9.0
Promotion opportunities	25.6	25.9	31.1	31.3	26.1	29.2	9.5	9.5	8.7	4.9
Management style	31.4	32.2	39.0	39.6	20.3	20.0	5.4	5.7	4.2	2.4
More work variety	18.4	22.4	43.7	46.1	28.2	25.7	5.6	2.5	4.8	3.7
Family Responsibilities	22.7	23.0	31.5	24.3	30.3	30.5	9.0	12.3	7.2	9.9
Personal Reasons	21.9	22.4	32.0	31.1	32.4	32.4	9.1	9.5	5.7	5.4

The most prominent reasons for leaving a job relate to achieving ambitions in engineering and to job or workplace characteristics. Broadening engineering experience, higher salaries in engineering and jobs with more responsibilities that utilise an individual’s abilities are also key factors. Moving to a new job that offers a change in management style and greater work variety are also important considerations. Leaving engineering for other fields was quite unimportant and suggests retention in engineering is related to prospects and conditions in engineering.

<sup>23</sup> The  $\chi^2$  was 3.851 and was statistically significant at the 1% level with 1 df.

**Figure 3.6: The Weight of Opinion about Reasons for Leaving Present Employment During the Next Twelve Months**



There were two opportunities to nominate family responsibilities as reasons for wanting to move to a new job. In hindsight, this may have split views on this issue. However, even though the weight of opinion clearly indicated these were important issues for both men and women, these reasons ranked behind a host of other considerations.

### **3.8 Key Points**

Survey participants were more likely to be employed and less likely to be unemployed than in the engineering labour force as a whole. Labour force participation rates were well above census figures for both men and women. The gender differences that were apparent in census statistics were not reflected in the survey response. An important difference between the survey and official statistics was the incidence of part time work, particularly among women, which was about half that in the engineering labour force. This importance stems from recognising that part time work in the engineering labour force is particularly low when compared to part time work available in other fields. Since part time work is one way of coping with family responsibilities, the survey shows that this mechanism is under-utilised, in engineering, and especially so, by members.

At face value, income distributions suggest that more women earn lower incomes than men and more men earn higher incomes than women. However, this comparison confuses hours worked and experience in engineering or seniority, as well as gender. When income distributions are segmented by age, to reflect experience and seniority, hours worked and gender, the results are much clearer and stronger:

- The full time salaries of men and women aged in their 20s were significantly different at the ten percent level but not at the more acceptable five percent level, suggesting only weak support for women earning lower salaries.
- The part time salaries of men and women in their 20s were significantly different at the one percent level, suggesting that women in this group earned less than men.
- In the 30s age group, both full time and part time salaries for women were significantly less than for men, in both cases at the one percent level.
- The 30s result was repeated for the 40s age group with even stronger statistics.
- In the 50s age group, full time salaries for women were significantly less than men but the comparison of part time salaries was hampered by small numbers.

These results strongly support the view that, with the exception of women working full time and aged in their 20s, women engineers earn less than men.

Engineers show evidence of being relatively mobile and only 60.4% of men and 58.1% of women have a strong attachment to their present jobs in the year ahead. A further 18.5% of men and 16.8% of women indicated neutral views. The balance, 21.1% of men and 25.1% of women have only a weak attachment to their present job and could move to new jobs. The risk in these results is that whether a move occurs within engineering depends on the labour market at the time. In the survey, the most prominent reasons why respondents might change jobs relate to furthering engineering careers. Factors such as broadening experience, higher salaries, and jobs with more responsibilities and more attuned to abilities were prominent for men and women. Compatibility with family responsibilities was an important consideration, but was ranked in the middle of a list of fourteen possible reasons for moving. Leaving engineering for other fields was quite unimportant and suggests retention in engineering is related to prospects and conditions in engineering.

The industry distribution of survey participants has many similarities to the engineering labour force except for an under-representation of engineers in manufacturing. The key gender differences were the larger shares of women in engineering consultancy services and the smaller share in public administration and defence.

Women are less likely than men to be engaged in management and supervisory activities and more likely than men to be involved in technical and design work. Over 72% of respondents were employed in the private sector, predominantly in enterprises with over 100 employees. Women were more likely to be employed in the largest enterprises and least likely to be employed in the smallest enterprises.

# 4 WORKING CONDITIONS AND WORKPLACE FLEXIBILITY

This chapter reviews survey participants' satisfaction with a range of issues relating to their present jobs, including working arrangements and conditions, industrial relations and management of work places and the working environment. The chapter also reviews the place of job descriptions, staff appraisal arrangements and their connection to salaries and career opportunities and concludes with a review of flexible working arrangements that are available and the degree of participation in workplace decision making.

## 4.1 Satisfaction with Present Job

Survey participants were asked how satisfied they were with eighteen aspects of the working conditions in their present jobs, including physical conditions, working arrangements, recognition of responsibility and efforts, salaries, relationships with supervisors and colleagues, job security and staff development. Participants were also asked to take into account their views on specific issues and to summarise them into a composite view about their degree of satisfaction with their job.

Each issue was explored using a five point scale ranging from very dissatisfied to very satisfied with a neutral central point. To simplify analysis the concept a "satisfaction gap" was used. The satisfaction gap was defined as the sum of "very satisfied" and "satisfied" less the sum of "very dissatisfied" and "dissatisfied" responses. The relative size of satisfaction gaps can be used to evaluate the mood of survey participants about the issue in question, and the rank order of satisfaction gaps indicate which issues are more important to participants.

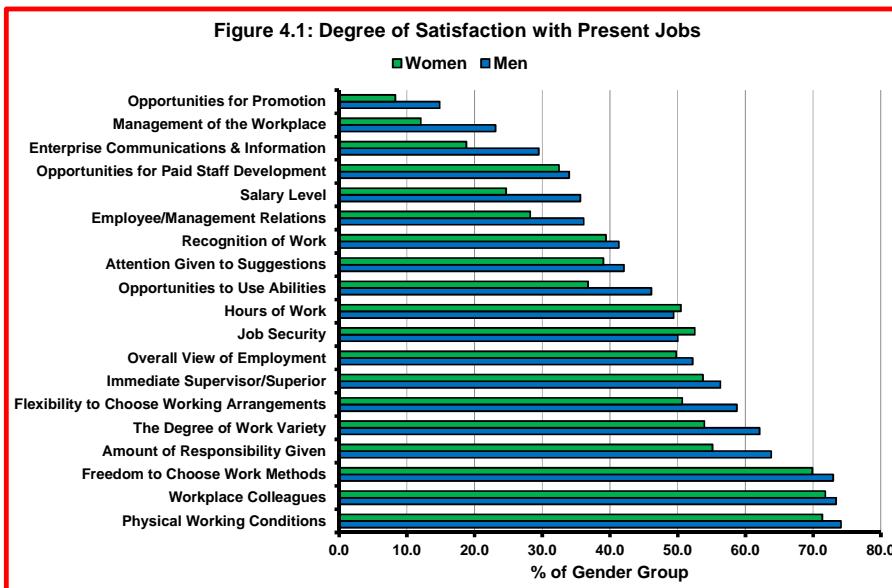


Figure 4.1 illustrates the satisfaction gaps for men and women for each of the 18 issues canvassed and includes the satisfaction gap for participants' overall assessment of their jobs. The issues are ranked from bottom to top according to the size of the satisfaction gap for men to draw out the comparison with women. The scale of satisfaction gaps are set out in Table 4.1 by gender and age.

## Working Environment and Engineering Careers

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Table 4.1: Respondents Satisfaction Gaps in Relation to Working Conditions & Arrangements (%)

### MEN

Workplace Issue	Age Group (years)						
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	All Ages
Physical Working Conditions	75.9	73.1	72.3	71.6	77.4	89.3	74.1
Freedom to Choose Work Methods	72.6	71.5	70.1	73.6	78.4	88.2	73.0
Flexibility to Choose Working Arrangements	59.1	56.4	53.7	57.5	71.8	76.2	58.7
Workplace Colleagues	72.7	71.5	73.9	72.0	79.9	75.4	73.4
Recognition of Work	41.5	40.3	36.8	37.0	52.3	70.2	41.3
Immediate Supervisor/Superior	67.3	58.7	48.5	51.2	53.3	56.5	56.3
Amount of Responsibility Given	59.5	62.6	61.7	65.0	71.5	87.3	63.8
Salary Level	21.9	28.1	37.9	44.3	54.6	55.5	35.6
Opportunities to Use Abilities	41.0	45.1	44.3	43.7	60.0	74.8	46.1
Employee/Management Relations	36.5	33.6	35.3	33.9	41.9	54.6	36.1
Opportunities for Promotion	21.0	12.6	8.5	10.5	22.4	43.7	14.9
Management of the Workplace	23.9	22.3	20.8	21.9	24.0	46.6	23.1
Attention Given to Suggestions	44.2	42.8	38.2	37.0	47.3	65.0	42.0
Hours of Work	49.1	47.8	44.1	46.8	62.5	76.5	49.4
The Degree of Work Variety	54.3	56.6	62.1	65.8	76.6	90.9	62.1
Job Security	61.5	48.5	43.3	42.0	55.9	63.6	50.0
Enterprise Communications & Information	28.7	29.1	24.8	27.9	39.4	47.5	29.5
Opportunities for Paid Staff Development	36.0	31.5	29.9	35.4	39.5	42.4	34.0
Overall View of Employment	54.2	51.1	47.1	50.0	60.6	70.0	52.2

### WOMEN

Physical Working Conditions	74.7	68.9	69.5	65.5	75.0	100.0	71.4
Freedom to Choose Work Methods	72.1	68.9	75.0	66.1	75.0	100.0	69.9
Flexibility to Choose Working Arrangements	53.8	48.4	51.6	44.6	37.5	100.0	50.7
Workplace Colleagues	76.5	67.3	69.3	69.6	75.0	100.0	71.8
Recognition of Work	49.7	27.8	38.3	36.4	50.0	0.0	39.4
Immediate Supervisor/Superior	63.1	49.2	42.9	41.8	71.4	0.0	53.7
Amount of Responsibility Given	54.6	55.0	59.4	53.7	62.5	0.0	55.1
Salary Level	27.5	17.9	30.5	30.4	37.5	0.0	24.7
Opportunities to Use Abilities	40.3	35.2	32.5	33.9	25.0	100.0	36.8
Employee/Management Relations	36.5	21.1	25.2	14.5	62.5	0.0	28.2
Opportunities for Promotion	17.6	2.2	0.0	-1.9	12.5	0.0	8.3
Management of the Workplace	21.4	2.6	7.3	9.1	12.5	100.0	12.1
Attention Given to Suggestions	44.4	34.2	37.8	30.9	37.5	100.0	39.0
Hours of Work	56.8	39.9	57.5	44.4	85.7	100.0	50.5
The Degree of Work Variety	52.5	53.4	59.4	50.9	75.0	100.0	53.9
Job Security	63.4	47.0	38.3	39.3	62.5	0.0	52.5
Enterprise Communications & Information	24.3	11.7	16.9	17.9	62.5	0.0	18.8
Opportunities for Paid Staff Development	40.1	27.8	23.6	21.4	50.0	0.0	32.5
Overall View of Employment	57.8	43.5	41.6	46.4	75.0	0.0	49.8

Both men and women expressed high degrees of satisfaction in their overall assessments of their jobs. The satisfaction gap was 52.2% for men and 49.8% for women. Almost two-thirds of survey participants said they were very satisfied or satisfied; 65.9% of men and 64.9% of women. More women than men expressed dissatisfaction with their present jobs; 15.1% of women compared to 13.3% of men.

The range of satisfaction with different issues was very large; from 74.1% to 14.9% for men and from 71.4% to 8.3% for women. Men had satisfaction gaps higher than their overall job assessments for 7 issues, including:

- Physical working conditions
- Freedom to choose work methods
- Flexibility to choose working arrangements
- Immediate supervisors
- Responsibility they were given, and
- Work variety

Women also had satisfaction gaps higher than their overall job assessments for these issues as well as two others; hours of work and job security. When satisfaction gaps were high, typically this result was evident for all age groups.

The lowest satisfaction gaps were for issues that were common to men and women. The satisfaction gap for promotion opportunities was 14.9% for men and 8.3% for women; a quarter of responses indicated they were dissatisfied or very dissatisfied, 24.1% for men and 28.2% for women. The next lowest was satisfaction with management of the workplace where the gap was 23.1% for men and 12.1% for women; about one fifth of responses indicated they were dissatisfied or very dissatisfied, 18.7% of men and 22.8% of women. When satisfaction gaps were low variation by age resulted in very low figures in some age groups; for example, satisfaction with opportunities for promotion were zero and negative, respectively for women in their 40s and 50s and just 8.5% for men in their 40s.

## 4.2 Gender Differences in Job Satisfaction

Figure 4.1 shows apparent gender differences for a number of issues but these differences are in relation to satisfaction gaps. When the gender distributions for the five point satisfaction scale were investigated, no statistically significant differences were found at the aggregate level for any issue. However, when the same investigation was carried out by age group several significant differences were found. These indicated that:

- Women in the 30s age group were less satisfied than men with the freedom available to choose work methods<sup>24</sup>.
- Women in the 30s, 40s and 50s age groups were less satisfied than men with the flexibility available to choose working arrangements<sup>25</sup>.
- Women in their 40s and 50s were less satisfied with workplace colleagues than men<sup>26</sup>.
- Women in their 30s, 40s and 50s were less satisfied than men with the level of responsibility they were given<sup>27</sup>.
- Women in their 40s and 50s were less satisfied than men their opportunities to use their abilities<sup>28</sup>.
- Women in their 30s, 40s and 50s were less satisfied than men with relations between employees and management<sup>29</sup>.
- Women in their 30s, 40s and 50s were less satisfied than men with their opportunities for promotion<sup>30</sup>.
- Women in their 30s and 50s were less satisfied than men with the way workplaces were managed<sup>31</sup>.
- Women in their 40s and 50s were less satisfied than men with their hours of work<sup>32</sup>.
- Women in their 40s and 50s were less satisfied than men with the degree of variety in their jobs<sup>33</sup>.

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<sup>24</sup> The  $\chi^2$  statistic was 4.23 and this was statistically significant at the 5% level with 1 df.

<sup>25</sup> The  $\chi^2$  statistics for the 30s, 40s and 50s were 6.23, 9.48 and 16.70, respectively and were statistically significant at the 5%, 1% and 1% levels with 1 df.

<sup>26</sup> The  $\chi^2$  statistics for the 40s and 50s were 7.32 and 6.28 respectively and were statistically significant at the 1% and 5% level with 1 df.

<sup>27</sup> The  $\chi^2$  statistics for the 30s, 40s and 50s were 4.07, 4.07 and 4.46 respectively and all were statistically significant at the 5% level with 1 df.

<sup>28</sup> The  $\chi^2$  statistics for the 40s and 50s were 4.76 and 10.49 respectively and were statistically significant at the 5% and 1% level with 1 df.

<sup>29</sup> The  $\chi^2$  statistics for the 30s, 40s and 50s were 4.52, 5.59 and 7.42 respectively and were statistically significant at the 5%, 5% and 1% levels with 1 df.

<sup>30</sup> The  $\chi^2$  statistics for the 30s, 40s and 50s were 5.23, 3.64 and 8.32 respectively and were statistically significant at the 5%, 5% and 1% level with 1 df.

<sup>31</sup> The  $\chi^2$  statistics for the 30s and 50s were 7.25 and 8.49 respectively and were both statistically significant at the 1% level with 1 df.

<sup>32</sup> The  $\chi^2$  statistics for the 40s and 50s were 7.35 and 4.87 and were statistically significant at the 1% and 5% level respectively with 1 df.

<sup>33</sup> The  $\chi^2$  statistics for the 40s and 50s were 5.36 and 6.86 respectively and were statistically significant at the 5% and 1% levels with 1 df.

- Women in their 30s, 40s and 50s were less satisfied than men with communications and dissemination of information in their workplaces<sup>34</sup>.
- Women in their 40s and 50s were less satisfied than men with their opportunities for paid staff development and/or training<sup>35</sup>.

There are two common elements in these results. No statistically significant differences were found between men and women aged in their 20s. However, there were five issues where statistically significant differences were found between men and women aged in their 30s, 40s and 50s and a further six issues where statistically significant differences were found for two age groups, most often for the 40s and 50s age groups. There is a pattern here that should not be ignored and warrants further detailed investigation.

### **4.3 Job Descriptions**

Clear written job descriptions were in place for 72.4% of men and 71.4% of women. The corollary was that 27.6% of men and 28.6% of women were expected to carry out their jobs as engineers without formal job descriptions. Table 4.2 shows that the prevalence of formal job descriptions varied in a small range for men under 60 years and women under 50 years. Among men aged in their 60s and 70s, the proportions having job descriptions fell with age but there was a step-wise increase in the proportion of women with job descriptions to 75% or more. It was noteworthy that in the 20 to 29 years age group, the formative years for engineering careers, 29.5% of both men and women were working without a formal job description.

Figure 4.2 shows that the prevalence of formal job descriptions broadly increases with the size of the employing organisation but there are several clear gender differences. Among the smallest organisations, 45.9% of men and 57.9% of women had formal job descriptions. In organisations between 11 and 20 employees, the proportions were about 60% for both genders. However, in mid-size organisations, there was a substantial difference between men and women; in organisations with 20 to 50 employees, 65.4% of men and 81.1% of women had formal job descriptions and in organisations with 50 to 100 employees, 69.3% of men and 83.3% of women had formal job descriptions. In the two largest groups of organisation, this gender difference largely disappeared and over 70% of respondents reported formal job descriptions.

Table 4.2: Job Descriptions and Their Relevance

**Men**

Issue Position Description	Age Group (years)						
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	All Ages
Job had clear written position description							
Yes	70.5	77.4	72.1	73.7	66.3	53.3	72.4
No	29.5	22.6	27.9	26.3	33.7	46.7	27.6
Position description a good indicator of work done							
Yes	59.1	64.6	59.9	62.4	66.7	53.6	62.0
No	40.9	35.4	40.1	37.6	33.3	46.4	38.0

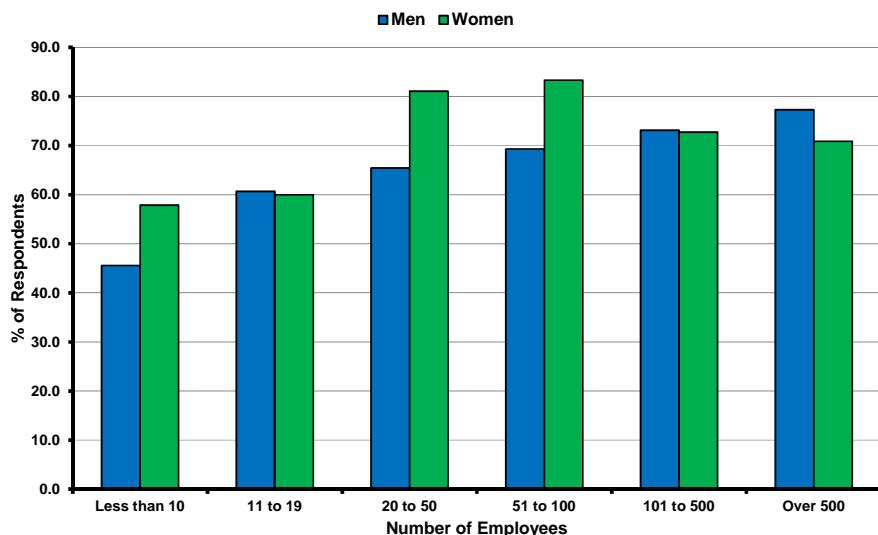
**Women**

Job had clear written position description	70.4	71.8	71.4	76.8	75.0	0.0	71.4
Yes	29.6	28.2	28.6	23.2	25.0	100.0	28.6
Position description a good indicator of work done	58.6	57.3	58.5	58.5	75.0	0.0	58.2
Yes	41.4	42.7	41.5	41.5	25.0	0.0	41.8

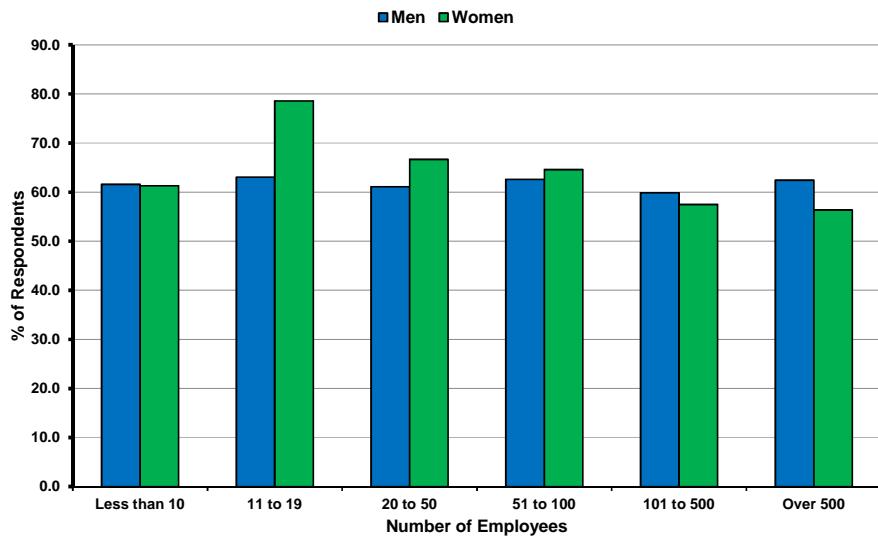
<sup>34</sup> The  $\chi^2$  statistics for the 30s, 40s and 50s were 5.54, 8.28 and 3.85 and were statistically significant at the 5%, 1% and 5% levels respectively with 1 df.

<sup>35</sup> The  $\chi^2$  statistics for the 40s and 50s were 6.27 and 42.35 and were statistically significant at the 5% and 1% levels with 1 df.

**Figure 4.2: Organisation Size and Prevalence of Formal Job Descriptions**



**Figure 4.3: Organisation Size and the Relevance of Job Descriptions**



In 2007, 67.3% of men and 67.8% of women indicated that their job description was a good indicator of the work they actually did. The 2012 results show that these proportions are now lower; 62.0% of men and 58.2% of women in the 2012 survey indicated that their job descriptions were a good indicator of their actual work. Conversely, 38.0% of men and 41.8% of women believed that their job descriptions were not a good indicator of their actual work. The main variations in these results for different age groups occurred at older ages. Figure 4.3 shows that with one exception, organisation size did not affect the relevance of job descriptions.

## 4.4 Performance Appraisals

Formal performance appraisal systems have been part of the HR landscape for some time. In some organisations, performance appraisals are linked to salaries in some way, either to annual salary increases or to "at risk" or bonus elements of salary packages. Table 4.3 shows the prevalence of performance appraisals by gender and age group and also the proportions of respondents whose salaries are dependent on their performance appraisals in some way.

## Working Environment and Engineering Careers

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Table 4.3: Performance Appraisals and Their Relevance to Salaries

**Men**

Issue Performance Appraisals	Age Group (years)						
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	All Ages
Enterprise had a performance appraisal process							
Yes	86.9	86.8	84.1	82.9	70.4	67.2	83.3
No	13.1	13.2	15.9	17.1	29.6	32.8	16.7
Salary increase depended on performance appraisal							
Yes	49.2	45.7	45.9	48.2	42.4	38.1	46.4
No	50.8	54.3	54.1	51.8	57.6	61.9	53.6

**Women**

Issue Performance Appraisals	Age Group (years)						
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	All Ages
Enterprise had a performance appraisal process							
Yes	91.8	89.4	80.8	71.4	100.0	0.0	88.1
No	8.2	10.6	19.2	28.6	0.0	100.0	11.9
Salary increase depended on performance appraisal							
Yes	49.9	50.6	44.3	33.9	75.0	0.0	48.6
No	50.1	49.4	55.7	66.1	25.0	0.0	51.4

Figure 4.4: Organisation Size and the Prevalence of Performance Appraisals

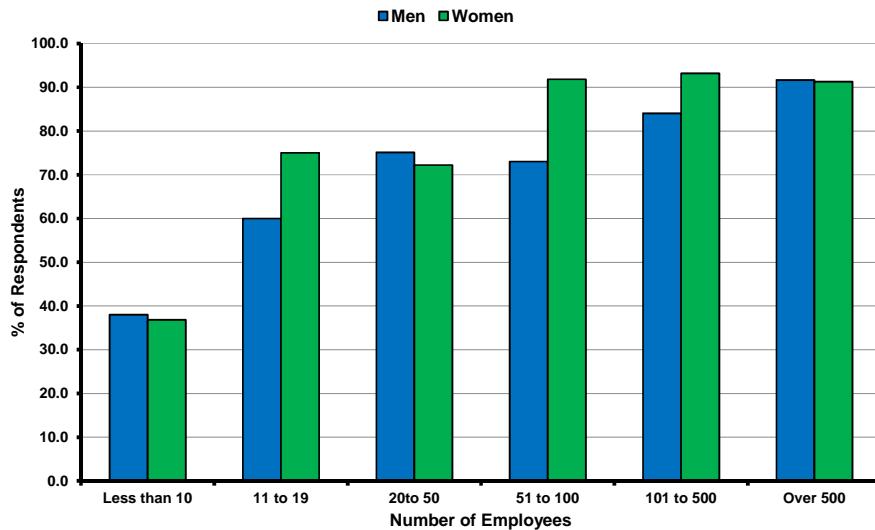
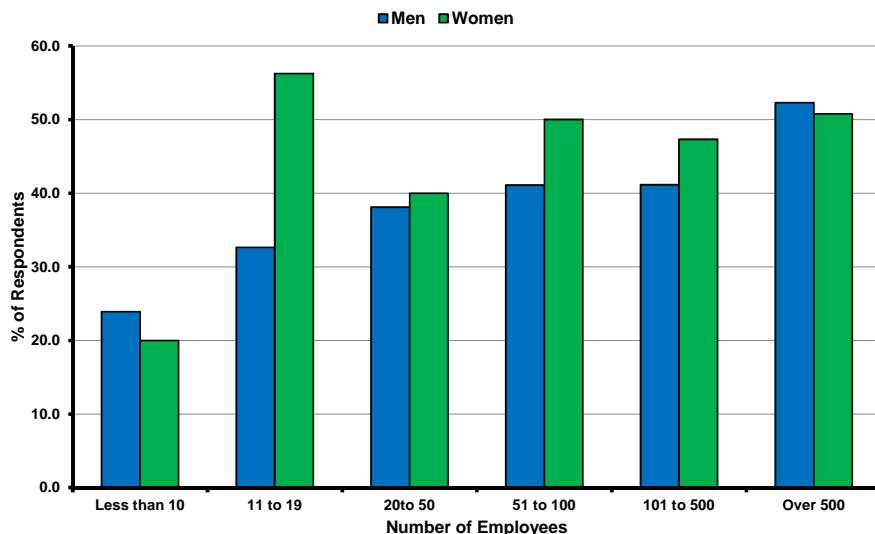


Figure 4.5: Organisation Size and Performance Related Salaries



Proportionally more women have formal performance appraisals than men; 88.1% across all ages compared to 83.3% for men. In 2007, the corresponding figures were just over 86% for men and women. The proportions for men under 60 years varied in a narrow range from 83

to 87% and for the 60 years and over fell with age fairly sharply. The proportion of women who had formal performance appraisals increased with age from 91.8% in the 20 to 29 years age group to 71.4% in the 50 to 59 years age group. The figures for older women's age group are not reliable.

The prevalence of performance appraisals increases with organisation size. Figure 4.4 shows that the lowest proportions occur in organisations with less than 10 employees; 38.0% for men and 36.8% for women. The proportion of women with performance appraisals was well over 90% in each of the three largest groups of organisations. There was gender equality in only the largest group, in excess of 500 employees, in the other two groups, the proportion of men with performance appraisals was well below that for women but was increasing with organisation size.

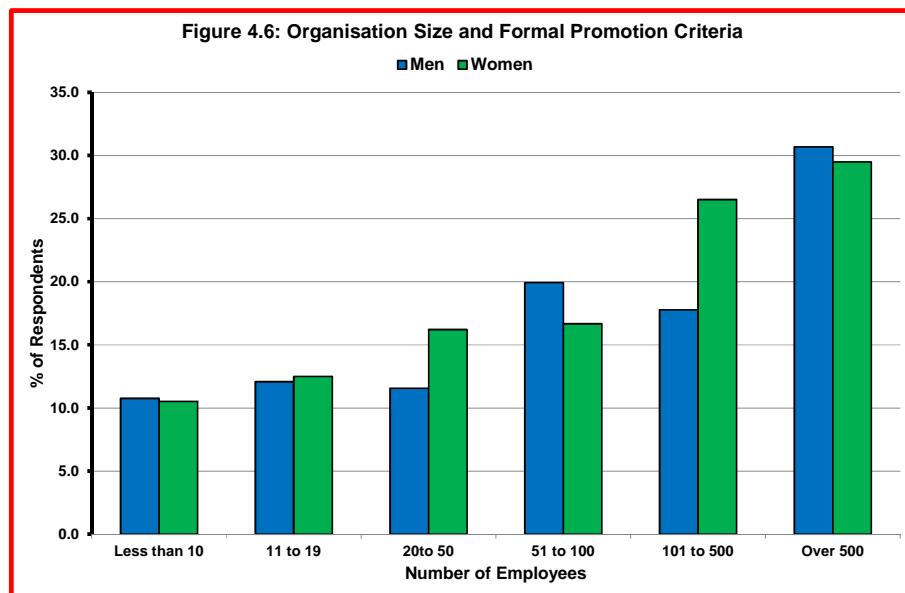
Performance appraisals were linked to salaries for 46.4% of men and 48.6% of women. These figures compare to 55.4% and 49.0%, respectively, for men and women in 2007. The highest proportions occurred in some of the youngest age group (discounting over 60 years women because of the small numbers); 49.2% of men and 49.9% of women in the 20 to 29 years age group, and 50.6% of women in the 30 to 39 years age group, had salaries linked to performance appraisals. Figure 4.5 shows that performance appraisals linked to salaries broadly increase with organisation size. The lowest proportions occur in the smallest organisations; 23.9% for men and 20.0% for women. The highest proportions occur in the largest organisations; 52.3% for men and 50.8% for women. There was an unusual result for women in their 30s; 56.3% indicated that their salaries were linked to their performance appraisals. This was the second largest women's age group, but the number of women who were employed in the organisation size in question was small and this may explain the result.

## **4.5 Promotion Criteria and Career Paths**

In 2007, only 27.8% of men and 31.4% of women worked in jobs with clearly written promotion criteria. In 2012, the results were very similar; 24.8% of men and 26.3% of women. The corollary was that about three-quarters of respondents worked in jobs that did not have clearly written promotion criteria. Table 4.4 shows these results and the results for two related career issues in aggregate and by age group. Age group did not appear to be a factor with all men's and women's age groups except one recording proportions below 30%; women in the 50 to 59 years age group recorded 32.7%.

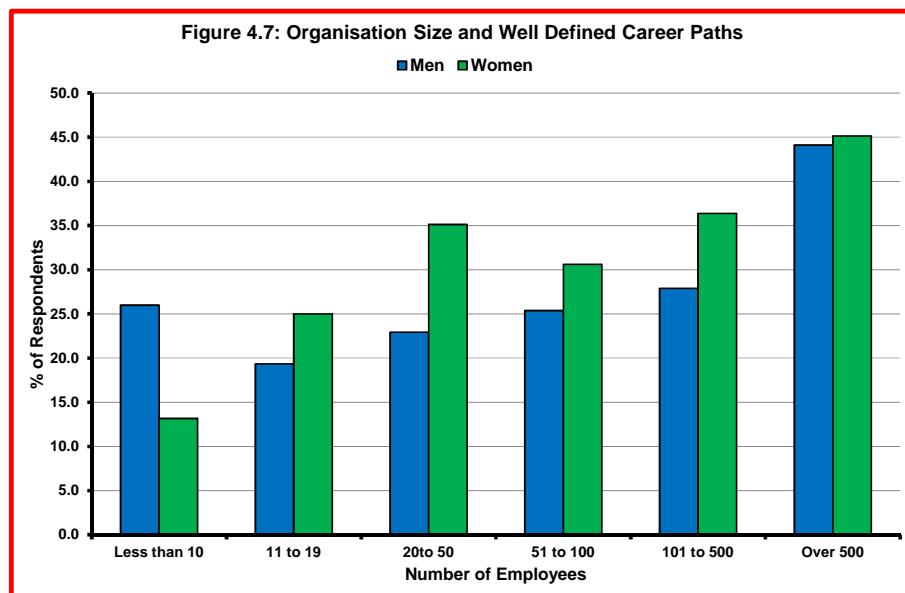
Table 4.4: Promotion Criteria and Career Paths

Men		Age Group (years)						
Career Issue		20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	All Ages
Enterprise had clearly written promotion criteria								
Yes	27.1	25.6	23.1	25.4	22.3	17.2	24.8	
No	72.9	74.4	76.9	74.6	77.7	82.8	75.2	
Enterprise had well defined career path								
Yes	47.1	38.4	33.0	32.4	31.4	38.3	37.1	
No	52.9	61.6	67.0	67.6	68.6	61.7	62.9	
Enterprise offered alternative career directions								
Yes	69.4	59.5	53.0	54.3	50.8	53.8	58.1	
No	30.6	40.5	47.0	45.7	49.2	46.2	41.9	
 Women								
Enterprise had clearly written promotion criteria								
Yes	29.4	24.1	20.5	32.7	12.5	0.0	26.3	
No	70.6	75.9	79.5	67.3	87.5	100.0	73.7	
Enterprise had well defined career path								
Yes	47.2	37.2	32.8	43.6	12.5	0.0	40.9	
No	52.8	62.8	67.2	56.4	87.5	100.0	59.1	
Enterprise offered alternative career directions								
Yes	69.2	58.0	50.4	50.9	25.0	0.0	61.1	
No	30.8	42.0	49.6	49.1	75.0	100.0	38.9	

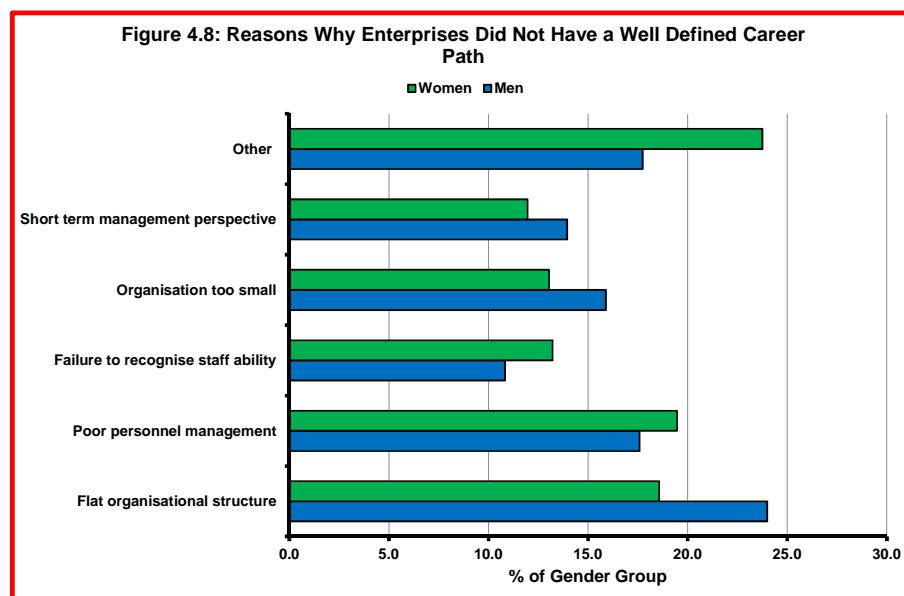


The prevalence of clearly written promotion criteria increases with organisation size as illustrated in Figure 4.6. The lowest proportions occurred in the smallest organisations; 10.8% for men and 10.5% for women. The highest proportions occurred in the largest organisations; 30.7% for men and 29.5% for women.

In 2007, 64.3% of men and 59.7% of women indicated that their organisation offered a clear career path. Much lower results were found in the 2012 survey; only 37.1% of men and 40.9% of women indicated that their organisation offered clearly defined career paths. The highest proportions occurred in the 20 to 29 years age group where 47.1% of men and 47.2% of women indicated their organisation offered clear career paths. In other age groups the results were equal to or below the survey average except for women aged 50 to 59 years where 43.6% was recorded. Gender difference did not appear to be an issue. Figure 4.7 shows there was a loose association between organisation size and availability of clear career paths. Among men, the proportion was 26.0% in the smallest organisations but while lower in the 10 to 20 employees group, it increased steadily thereafter to 44.1% for organisations with more than 500 employees. Among women, just 13.2% in the smallest organisations indicated there was a clear career path. The proportion generally increased with organisation size to 45.1% where there were more than 500 employees.



The proportion of respondents who indicated their organisations offering career paths outside of engineering were higher than the proportion of respondents who indicated clear career paths were available in engineering. About 58.1% of men and 61.1% of women indicated alternative career paths were available with the highest proportions occurring in the youngest age group. There was little evidence of gender difference.



There were many reasons why career paths were limited as shown in Figure 4.8. Some were related to the character of the organisation (flat organisation or the organisation was too small); this was the response given by 39.9% of men and 31.6% of women. However, poor management (poor personnel management, failure to recognise staff ability and short term perspective) was also a factor in the responses from 42.3% of men and 44.7% of women.

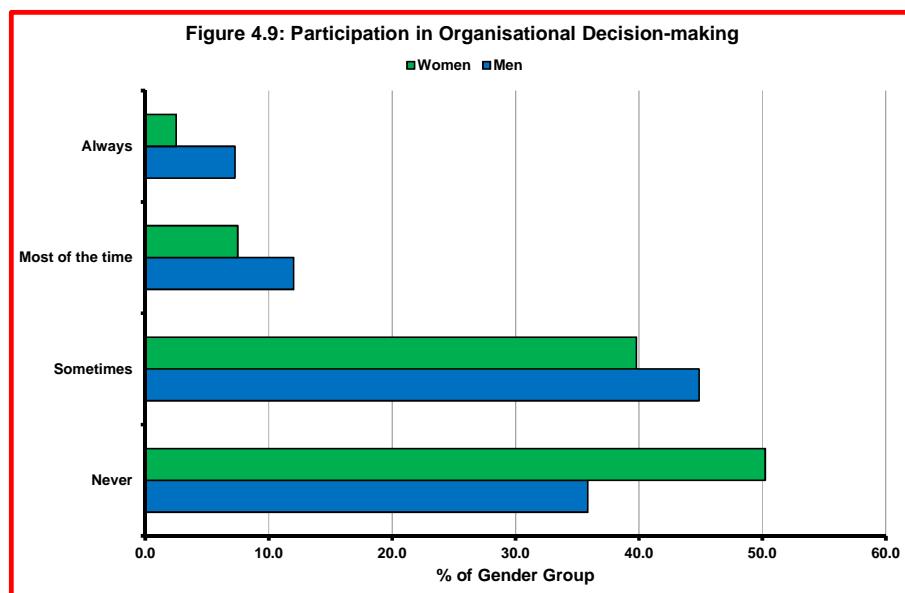
## **4.6 Participation in Decision Making**

Participation in organisational decision making was explored in both the 2007 and 2012 surveys and quite different results were obtained. In 2007, 13.5% of men and 17.5% of women reported that they never participated in decision making, 51.6% of men and 57.5% of women reported that they sometimes participated and 34.9% of men and 24.9% of women indicated that they participated most of the time or always. The results obtained in the 2012 survey are illustrated in Figure 4.9 and indicate much lower levels of participation all round.

The proportion of survey participants who never participate in decision making was much higher in 2012; 35.8% of men and 50.2% of women. A substantial part of this result was the high “never” responses reported by the 20 to 29 and 30 to 39 years age group; 54.8% for men and 60.0% for women in the 20 and 40.1% for men and 47.3% for women in the 30s age group. The “never” response was lowest in the smallest organisations and highest in the largest organisations, increasing fairly consistently with organisational size. Among men, 11.2% never participated in decision making in organisations with less than 10 employees, increasing to 40.4% for organisations with more than 500 employees. Among women, 23.7% never participated in decision making in the smallest organisations, increasing to 54.7% in the largest organisations.

In 2012, 44.9% of men and 39.8% of women reported that they sometimes participated in decision making. Typically young age groups recorded lower results and middle age groups higher ones; 39.1% of men and 35.5% of women in their 20s indicated that they sometimes participated in decision making. Men in their 30s and older had proportions at or above

average except for the 70 years and older group with 30.5%. Women in their 30s and 40s had proportions of about 44% who sometimes participated in decision making, falling to 37.5% for the 50s age group.



Substantially lower proportions of the 2012 survey participated in organisational decision making most of the time or always; 12.0% of men and 7.5% of women participated most of the time and 7.3% of men and 2.5% of women always participated. Among men, participation in these categories increases with age group; in the 20s, 5.1% of men participate most of the time and 1.0% always. By the 50s age group, these figures had increased to 14.6% and 10.3% respectively. Even higher figures apply to the two older age groups with 16.4% in the 60s and 31.4% in the 70 and over groups participating most of the time and 15.6% of the 60s and 21.2% of the 70 and over group always participating.

The pattern for women participating most of the time or always is similar to men for the 20s through to the 40s age group but at lower levels; 3.9% of women in their 20s participated most of the time, rising to 15.2% in the 40s age group and 0.3% of women in their 20s always participated, rising to 5.6% in the 40s age group. In the most of the time category, participation fell for older age groups but was not far removed from male rates. In the always category participation increased in both the 50s and 60s age groups.

Higher degrees of participation are closely related to organisation size. Participation of men most of the time is not greatly affected by organisation size; 12.6% of men participated in decision making in the smallest organisations and 10.7% in the largest. Organisation size was more important in the always category; 49.2% of men employed in the smallest organisations always participated compared to just 2.3% in the largest organisations. On average, 7.6% of women participated most of the time but the participation rates for the three smallest organisational categories were twice this level whereas in the largest organisations it was about average. On average, 2.5% of women always participated in decision making but the proportion was 23.7% in organisations with less than 10 employees. It was in small single digits in all other size categories including just 1% in the largest organisations. Earlier results showed that only 10.9% of women were employed in organisations with less than 50 employees while 89.1% were employed in organisations with more than 50 employees.

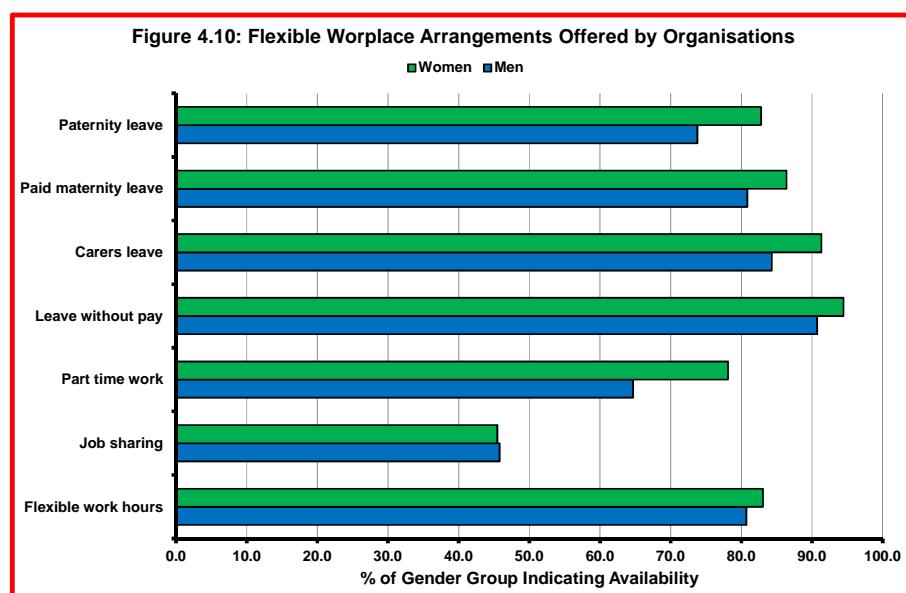
Age, and presumably experience, is clearly important to involvement in organisational decision making but so too is the organisational distribution of employment. The proportion of women employed in small organisations is less than men and conversely the proportions

employed in larger organisations is higher than men. However, survey results show that there is higher involvement in decision making in smaller organisations than in larger ones.

At the aggregate level, there was statistical evidence to support the view that women participated less in organisational decision making than men<sup>36</sup>. When repeated by age groups, there was no evidence of a gender difference for the 20s and 30s age group but evidence was found to support the view that women in the 40s and 50s age group were less involved in organisational decision making than men<sup>37</sup> and is probably linked to the lower proportion of women in management roles.

## **4.7 Availability of Flexible Working Arrangements**

Many of the organisations in which respondents worked offered a wide range of flexible working arrangements and practices as illustrated in Figure 4.10.



The proportion of survey participants reporting that their employer offered flexible working hours was remarkably similar to 2007 results; then 78.3% of men and 79.0% of women indicated this facility was available compared to 80.7% of men and 83.0% of women in 2012. The availability of flexible working hours was examined by age group and by the size of employing organisation. There was little variation by age group; for men under 60 years, the range was from 79.5% to 81.5% and for women in these age groups from 82.7% to 84.1%. Men in their 60s fitted into this pattern but lower results were found for the oldest group. The results for women over 60 years were patchier. The greatest flexibility was extended by the smallest organisations but in most cases the results were close together. For men the results ranged from 75.4% in organisations with less than 10 employees to 87.4% for organisations with between 20 and 50 employees; for women the range was from 87.2% in organisations with fewer than 10 employees to 68.8% in organisations with 11 to 20 employees. The latter result reflects very small number and is much lower than the next lowest result, 75.7% in the 20 to 50 employee category.

Job sharing continues to be the least popular approach to workplace flexibility. In 2007, 30.4% of men and 29.6% of women reported the availability of this facility. In 2012, the proportions were considerably higher but still short of half of survey participants; 45.8% of

<sup>36</sup> The  $\chi^2$  was 11.18% and was statistically significant at the 1% level with 1 df.

<sup>37</sup> The  $\chi^2$  were 4.39 and 6.04 and both were statistically significant at the 5% with 1 df.

men and 45.5% of women reported the availability of job sharing. The availability of job sharing appeared to fall with age group. The highest results were found in the 20 to 29 years age group where 54.2% of men and 50.1% of women said job sharing was available. The results were progressively smaller for older age groups with 38.5% of men in their 60s and 25.0% of men in the oldest age group reporting job sharing was available; the same pattern was observed for women with 40.0% in the 60s age group reporting availability.

There was a loose increasing relationship between firm size and availability of job sharing. The results were lowest for the smallest organisations with 36.5% of men and 31.4% of women reporting availability. The proportions were 49.2% for men and 48.2% of women in organisations with 500 or more employees but there were one or two outlying results.

The availability of part time work also has increased between the 2007 and 2012 surveys. For men, 55.5% reported that part time work was available in 2007 with the 2012 proportion increasing to 64.7%. The proportion of women reporting the availability of part time work was higher than men in 2007 at 67.7% and in 2012 this was 78.1%, maintaining the difference. The availability of part time work increased with age group for men from 60.9% in the 20 to 29 years group to 74.3% in the 60 to 69 years group, with lower results in the over 70 group. For women the highest results were in 20s, 30s and 40s age groups with 76.2%, 81.7% and 78.9% respectively. The results were lower in the older groups and closer to the corresponding men's results.

The most widely available arrangement was the availability of leave without pay. In 2007, 89.1% of men and 91.4% of women reported that leave without pay was available with slightly higher proportions in 2012; 90.7% for men and 94.4% for women. Age group did not appear to be a factor but organisation size could be. The highest proportions were reported for the organisations with most employees (93.4% for men and 96.1% for women) and the lowest results for the smallest organisations (82.7% for men and 76.3% for women) but this was not a straight-forward relationship with several outlier results.

The 2007 CREW report indicated that there had been a substantial increase in the availability of carer's leave between 1999 and 2007. The 2012 survey shows that further improvement has occurred. The availability of carer's leave was reported by 84.3% of men (up from 77.3% in 2007) and by 91.3% of women (up from 79.1% in 2007). For age groups under 60 years, the results were typically high with low variation between groups. The results were much lower in the over 60s groups. Organisation size did make a difference with the lowest results in the smallest organisations (52.8% for men and 89.4% for women) and the highest results in the largest organisations (89.4% for men and 94.4% for women).

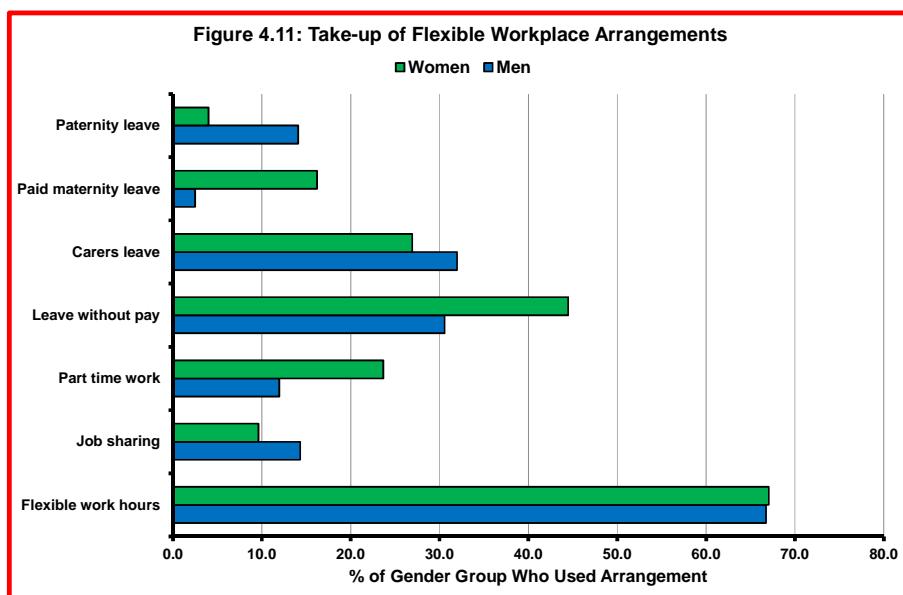
Paid maternity and paternity leave was more prevalent in 2012 than in 2007. In 2007, 70.0% of men and 72.4% of women reported that paid maternity leave was available and in 2012 the corresponding results were 80.9% for men and 86.4% for women. Similar changes were recorded for paid paternity leave with 73.8% of men (up from 68.6%) and 82.4% of women (up from 67.7%) reporting availability in 2012. The highest results occurred in the three age groups up to 50 years with lower results in other age groups. Organisation size appears to be an important factor in the availability of paid maternity and paternity leave. The lowest results occurred in the smallest organisations (men, 31.7% for maternity leave and 33.1% paternity leave and women, 45.7% for maternity leave and 43.8% for paternity leave) and the highest results occurred in the largest organisations (men, 89.8% maternity and 81.6% paternity leave and women, 92.9% maternity and 86.8% paternity leave).

In summary, the availability of flexible working arrangements appears to have improved markedly over the last five years. There are some differences between age groups but not sufficient to be important. There are some differences in the availability of flexible arrangements by gender but by and large the changes that have occurred have increased

flexibility for both genders considerably. The size structure of employing organisations is an important factor. Although the smallest organisations are more flexible with working hours, but the availability of job sharing, leave without pay, carers leave and maternity or paternity leave is much higher in the largest organisations. This is reflected in the distribution of survey participants' employment; 10.9% of women were employed in organisations with less than 50 employees compared to 17.2% of men and 68.2% of women were employed in organisations with over 500 employees compared to 62.3% of men. Implied here is a trade-off between the availability of flexible employment arrangements and the degree of participation in organisational decision making.

## **4.8 Take-up of Flexible Working Arrangements**

While the availability of flexible working arrangements has improved over time, the take-up of these arrangements is a different story entirely as illustrated in Figure 4.11.



The flexible practice most used by both men and women is flexible hours of work. In 2012, 66.7% of men and 67.1% of women indicated they had used flexible hours, well down on the 79.4% of men and 75.5% of women who used this source of flexibility in 2007. Among men age group was not a factor with similar results in all age groups. Women in their 20s and 30s reported the lowest results (59.7% and 70.0% respectively) but results over 75% were reported in the other women's age groups. The structure of employment was important with the highest results occurring in the smallest organisations. In organisations with less than 10 employees, 84.6% of men and 75.7% of women reported having used flexible hours compared to 64.1% of men and 64.3% of women in organisations with over 500 employees.

The take-up of job sharing arrangements was already well down on the availability of these arrangements in 2007 and the take-up reported in 2012 is considerably lower; 14.3% of men (down from 28.7% in 2007) and 9.6% of women (down from 18.0% in 2007) reported using job sharing arrangements. Job sharing was more prevalent in the younger men's age groups but age did not appear to be a factor for women. The proportion of men who job shared was highest in the smallest organisations and lowest in the largest. The same outcomes for the extremes were evident for women but there was not a consistent pattern in between with both higher and lower results occurring in the middle of the organisation size range.

The take-up of part time work was very similar between 2007 and 2012. The 2012 results were 12.0% of men had used part time work (compared to 10.1% in 2007) and 23.7% of

women (compared to 21.2% in 2007). Among men the take-up of part time work reflected the increasing incidence of part time work with age reported earlier. Among women, the lowest take-up (9.6%) of part time work was in the 20s age group with a sharp jump to 29.0% in the 30s age group and to 49.5% in the 40s age group, before falling back to 29.4% in the 50s. This pattern is consistent with take-up of part time work during child bearing/rearing years. The take-up of part time work was highest in the smallest organisations (44.1% for men and 45.7% for women) and lowest in the largest organisations (7.5% for men and 21.2% for women) with some outlier results to this pattern. Leave without pay may be the most available aspect of workplace flexibility but its take-up is very low and appears to have increased a little over the past five years. In 2012, 30.6% of men and 44.5% of women reported using leave without pay compared to 26.3% and 35.8% respectively in 2007. Age group does not appear to be a factor for men but the highest take-ups are for women aged in their 30s (49.3%) and 40s (51.3%). The take-up of leave without pay reduces as organisation size increases but there is not a clear pattern for women.

The take-up of carer's leave has increased since 2007 but compared to its availability, the use of this flexibility avenue is still very low. In 2012, 32.0% of men (up from 19.1%) and 26.9% of women (up from 18.1%) reported using carer's leave. The highest take-up rates for both genders were in the 30s (43.2% for men and 33.8% for women) and 40s (43.9% and 47.2%) age groups with much lower rates in the age groups either side. There was a suggestion that take-up rates were higher in larger organisations but the evidence for this is not entirely convincing.

Although the take-up of paid maternity and paternity leave has increased, compared to availability, the take-up rates are exceptionally low; 16.2% (compared to 11.7% in 2007) for the take-up of maternity leave by women and 14.1% (compared to 9.9% in 2007) for the take-up of paternity leave by men. Like carer's leave, the take-up was highest in the 30s (26.3% paternity leave and 26.9% maternity leave) and 40s (18.3% paternity and 21.5% maternity) age groups with lower rates in age groups on either side. The take-up of both paternity and maternity leave increases with size of organisation; paternity leave take-up is 6.0% in the smallest organisations and 15.4% in the largest; maternity leave take-up is 9.4% in the smallest organisations and 17.8% in the largest. However, these results are viewed, the highest take-up rates are low when compared to availability and do not appear to reflect the strong social support for these avenues of flexibility in the community at large.

The results in this and the previous section show that employers have become more conscious of the need for flexibility in working arrangements, but that the take-up of arrangements made available does not reflect these changes. The reluctance of survey participants to do so was not explored in the survey. To some extent, the size of organisations is an issue; smaller organisations are clearly more cost constrained than larger ones but take-up rates in larger organisations are also low even when it comes to arrangements that probably do not cost anything like flexible hours. These issues clearly warrant further investigation because flexible work practices cannot assist with employee retention unless employees feel able to use these options without career penalty.

## 4.9 Training Opportunities

Continuous professional development is essential to maintain current knowledge in engineering practice. The survey explored three aspects of training; paid continuous professional development opportunities in engineering during normal business hours, staff development opportunities not related to engineering to assist general career development and the opportunities for networking and/or continuous professional development while on maternity or paternity leave. The results are compiled in Table 4.4 by gender and age.

Table 4.5 shows that 70.7% of men and 71.1% of women reported that their employers offered continuous professional development opportunities during normal business hours. While the results varied between age groups, the range of variation was small and there was no apparent gender difference. There was no clear pattern in respect to organisation size although the higher results were typically in larger organisations. Once again there was no clear cut gender difference.

The proportions of survey participants who reported that their employers offered staff development opportunities unrelated to engineering were lower than the proportions that offered these opportunities in engineering; 62.3% of men and 66.9% of women. Age and gender variations were small. The main difference was through the structure of employment. The proportions of employers offering development opportunities unrelated to engineering increased with size of organisation; the lowest proportions were in the smallest organisations; 49.5% of men and 30.6% of women; and the highest in the largest organisations; 68.5% of men and 71.7% of women. Thus these gender differences reflect the structure of gender employment.

**Table 4.5: Availability of CPD, Staff Development and Networking Opportunities**

**Men**

Facility Available	Age Group (years)						
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	All Ages
<b>CPD opportunities during normal business hours</b>							
Yes	72.0	70.3	68.9	71.9	71.6	68.2	70.7
No	28.0	29.7	31.1	28.1	28.4	31.8	29.3
<b>Staff development opportunities unrelated to engineering</b>							
Yes	62.9	60.5	62.3	66.5	61.4	48.6	62.3
No	37.1	39.5	37.7	33.5	38.6	51.4	37.7
<b>Networking &amp;/or CPD opportunities while on maternity/paternity leave</b>							
Yes	37.2	29.7	25.3	26.9	24.4	10.0	28.7
No	62.8	70.3	74.7	73.1	75.6	90.0	71.3

**Women**

<b>CPD opportunities during normal business hours</b>							
Yes	72.5	69.1	70.2	72.7	100.0	0.0	71.1
No	27.5	30.9	29.8	27.3	0.0	100.0	28.9
<b>Staff development opportunities unrelated to engineering</b>							
Yes	68.6	66.0	64.5	66.7	75.0	0.0	66.9
No	31.4	34.0	35.5	33.3	25.0	100.0	33.1
<b>Networking &amp;/or CPD opportunities while on maternity/paternity leave</b>							
Yes	29.8	27.4	25.9	39.6	33.3	0.0	28.9
No	70.2	72.6	74.1	60.4	66.7	100.0	71.1

Less than one third of survey respondents reported that their employers offered networking and/or continuous professional development opportunities to staff on paternity or maternity leave. Among men the proportion varied slightly by age group being highest in the 20s group (37.2%) and lowest in the over 60s groups. This was also the case for women under 50 years but the results derived from the smaller numbers in the 50s and 60s age group did not continue this trend. Once again the gender differences reflect employment structure with the proportion of respondents with networking and/or training opportunities while on paternity or maternity leave increasing with size of organisation; from 15.8% in the smallest organisations to 33.9% in the largest in the case of men and from 12.5% in the smallest to 30.9% in the largest for women.

## **4.10 Care of Dependents**

The survey explored issues related to the care of dependent children while survey participants were at work, in particular, whether survey participants were responsible for dependent children, the number of children involved and whether adequate child care arrangements were available. Table 4.6 sets out responses by age and gender groups.

The first question in this section of the survey asked respondents whether they were responsible for dependent children while at work; 20.0% of men and 29.6% of women responded that they were. The result for men is slightly higher than in 2007 when 18.1% of men reported they were responsible for children while at work but the result for women is substantially higher than in 2007 when 21.9% reported they were responsible for children while at work.

**Table 4.6: Responsibility for and Care of Children**

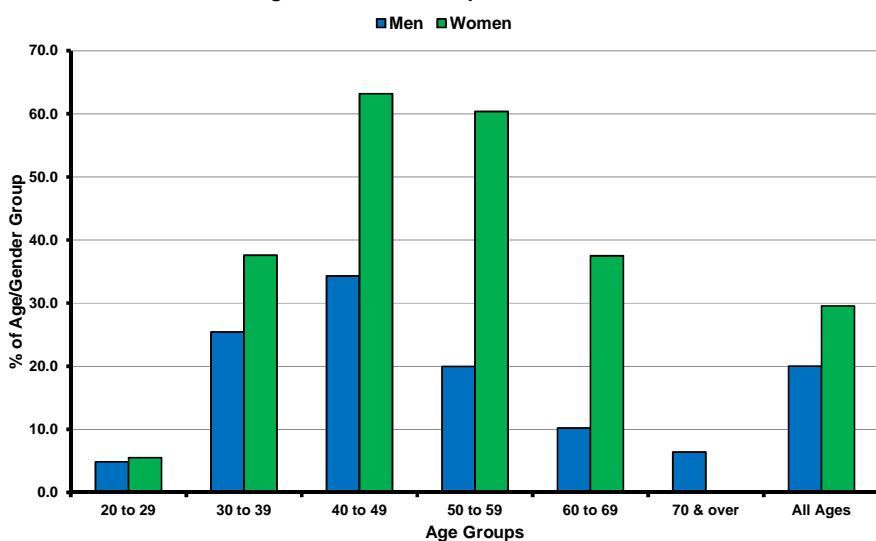
**Men**

Issue	Age Group (years)						
	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	All Ages
<b>Are you responsible for the care of children while working?</b>							
Yes (% of answers)	4.9	25.4	34.3	20.0	10.2	6.4	20.0
Yes (% of respondents)	4.1	22.0	30.7	17.9	8.7	5.1	17.4
<b>How many children were you responsible for?</b>							
One	2.9	13.7	10.5	6.8	4.1	3.6	8.2
Two	1.5	10.6	20.9	15.0	7.8	5.1	11.2
Three	0.0	3.6	7.8	6.1	6.0	5.1	4.5
More than three	0.1	0.8	2.2	2.7	2.7	5.1	1.6
<b>Did you have access to adequate child care other than yourself?</b>							
Yes (% of answers)	28.7	63.6	61.2	54.8	44.4	40.6	55.6
Yes (% of respondents)	4.6	29.6	35.5	25.5	17.8	19.0	23.3

**Women**

<b>Are you responsible for the care of children while working?</b>							
Yes (% of answers)	5.5	37.6	63.2	60.4	37.5	0.0	29.6
Yes (% of respondents)	4.8	34.1	58.5	53.3	37.5	0.0	26.3
<b>How many children were you responsible for?</b>							
One	3.5	16.8	15.6	16.7	0.0	0.0	10.7
Two	0.5	15.9	36.3	31.7	25.0	0.0	13.3
Three	0.0	1.5	8.1	13.3	25.0	0.0	2.8
More than three	0.0	0.6	1.5	1.7	0.0	0.0	0.5
<b>Did you have access to adequate child care other than yourself?</b>							
Yes (% of answers)	44.7	75.4	81.4	66.7	75.0	0.0	71.9
Yes (% of respondents)	4.3	31.7	51.9	43.3	37.5	0.0	23.6

**Figure 4.12: Care of Dependent Children**



However, there was an inconsistency between the responses to this and the subsequent question which asked respondents to nominate how many children they were responsible for; the responses from men to the second question exceeded responses to the first by over one quarter while the responses from women to the second question was about 8% lower than responses to the first. Bearing this qualification in mind, the largest family sizes were for

survey participants aged in their 40s, with substantial childcare responsibilities in the age groups on either side.

Figure 4.12 uses responses to the first question to explore gender and age group differences. Overall, the proportion of women with responsibilities for children is 50% larger than the proportion of men. Figure 4.12 shows that the differential between men and women increases rapidly from the 20s age group through to the 40s age group. These are the key results because the differentials in the 50s and 60s age groups reflect much smaller numbers and need to be treated with some caution.

In 2007, 62.3% of men and 70.8% of women reported they had access to adequate child care. The 2012 results were broadly similar with 55.6% of men and 71.9% of women reporting that they had access to adequate child care other than themselves.

The survey also explored whether survey participants had responsibilities for dependents other than children. In 2007, 4.7% of men and 5.1% of women had responsibilities of this nature and Table 4.7 shows that these dependencies have increased to 10.3% for men and 6.6% for women.

**Table 4.7: Responsibility for Dependents Other Than Children**

Men		Age Group (years)						
Issue		20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 & over	All Ages
<b>Are you responsible for someone other than your children while working?</b>								
Yes	6.5	7.4	11.5	13.2	14.7	9.1	10.3	
No	93.5	92.6	88.5	86.8	85.3	90.9	89.7	
<b>Do you have access to adequate care other than yourself while working?</b>								
Yes	33.5	40.6	38.1	44.0	40.6	36.8	39.7	
No	66.5	59.4	61.9	56.0	59.4	63.2	60.3	
Women								
<b>Are you responsible for someone other than your children while working?</b>								
Yes	2.5	5.5	9.0	22.9	20.0	0.0	6.6	
No	97.5	94.5	91.0	77.1	80.0	100.0	93.4	
<b>Do you have access to adequate care other than yourself while working?</b>								
Yes	25.7	41.4	38.8	42.9	100.0	0.0	38.3	
No	74.3	58.6	61.2	57.1	0.0	100.0	61.7	

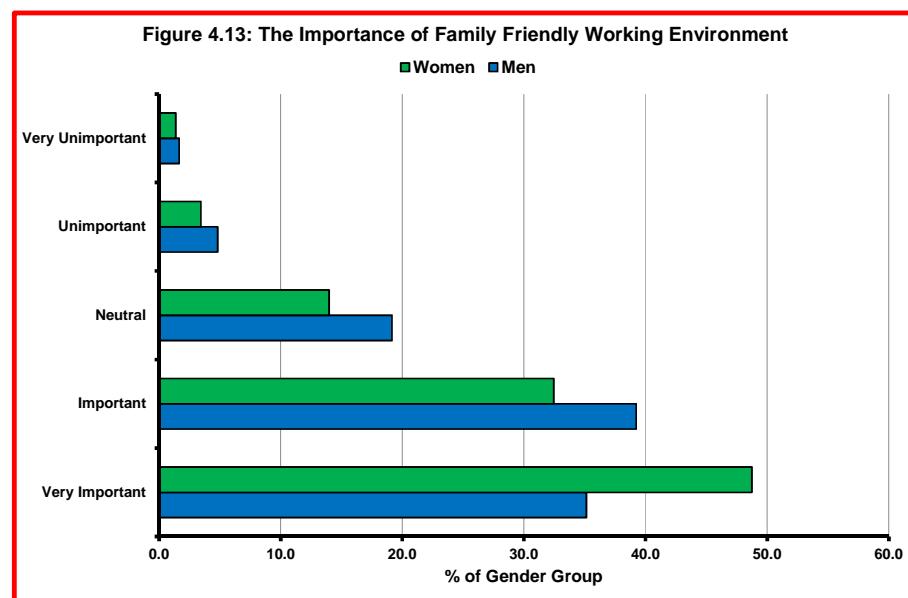
The proportions of men and women in this position was relatively small in the 20s age group (6.5% of men and 2.5% of women) but increases with age; in the case of men to a high of 14.7% in the 60s age group and for women to 22.9% in the 50s age group with a similar figure in the 60s age group. Responsibility for care of dependents other than children stands in contrast to child care arrangements; 39.7% of men and 38.3% of women indicated that they had adequate care arrangements but 60.3% of men and 61.7% of women indicated that they did not have adequate other arrangements. It is important to remember the small numbers involved when evaluating these results. This applies both to overall results and to age and gender differences.

## **4.11 Family Friendly Work Environment**

Section 3.9 considered the reasons why survey participants may choose to leave their jobs during the next 12 months. Family responsibilities were included in the array of possible reasons in two ways; moving to any job compatible with family responsibilities was ranked 6<sup>th</sup> out of 18 options by men and 8<sup>th</sup> by women; moving because of family responsibilities was ranked lower, 8<sup>th</sup> by men and 9<sup>th</sup> by women. This section discusses family responsibilities from a different perspective, the importance of a family friendly environment in choosing a new job.

Almost half of women survey participants (48.7%) and 35.1% of men rated a family friendly working environment as very important and a further 32.5% of women and 39.2% of men rated it as important. As Figure 4.13 illustrates, these responses swamp opposite and neutral views.

The gender difference evident in Figure 4.13 was investigated at the aggregate level shown in the illustration and at each age group from the 20s to the 50s. In all cases, there was statistical support for the view that women regarded a family friendly work environment as more important than men<sup>38</sup>.



Among men, the proportion that rated a family friendly workplace as very important increased from 27.2% in the 20s age group to plateau over 40% in the 30s and 40s age groups before falling back to 31.4% in the 50s. These figures show a strong belief among men, particularly those in age groups when families are likely to be young, to favour family friendly working environments. However, women are even firmer in their views with 39.9% of women in their 20s rating family friendly working environments as very important, increasing to 56.8% in the 30s age group and 59.8% in the 40s age group then falling back to 41.8% in the 50s.

## **4.12 Key Points**

The majority of survey participants were very happy with their present jobs. In a summary assessment of eighteen issues relating to their working conditions 65.9% of men and 64.9% of women indicated that they were very satisfied or satisfied with their jobs compared to 13.3% of men and 15.1% of women who indicated that they were dissatisfied or very dissatisfied.

When the eighteen issues were examined individually, there was an extraordinary range of views. Based on satisfaction gaps, the sum of very satisfied and satisfied less the sum of dissatisfied and very dissatisfied, there were seven issues that men rated as more satisfactory, sometimes substantially more satisfactory, than their overall job assessment. Women rated nine issues this way. The issues in this category were mainly those dealing with physical working conditions, flexibility to decide work methods and arrangements, colleagues and supervisors.

<sup>38</sup> The  $\chi^2$  statistics were as follows; overall, 8.27; 20s age group, 9.78; 30s age group, 8.20; 40s age group, 15.63 and 50s age group, 7.72. All were statistically significant at the 1% level with 1 df.

At the other end of the scale, the least satisfactory issue was opportunities for promotion which had a satisfaction gap of 14.9% for men and 8.3% for women. When age group variation was also considered, men in their 40s had a satisfaction gap of 8.5% and women in their 40s and 50s had satisfaction gaps of zero and -1.9%. The second least satisfactory issue was management of workplaces which had satisfaction gaps of 23.1% for men and 12.1% for women. Promotion and careers go hand in hand and unhappiness in the workplace is often the reason for job changes. The higher levels of dissatisfaction with these issues coupled with the comparatively high proportion of survey participants with weak attachment to their jobs, considered in the previous chapter, are a matter of concern and warrant more detailed investigation.

At the aggregate level, the apparent gender differences in satisfaction gaps did not translate into statistically significant differences in the views of men and women. However, when further dissected by age groups, there were statistically significant differences indicating lower satisfaction among women than men. Typically, no statistically significant differences were found for the youngest age group, participants aged 20 to 29 years. However, there was a clear pattern of less satisfaction in other age groups, particularly the 40 to 49 years and 50 to 59 years age groups. Combined with other matters covered in the survey, this pattern is a cause for concern.

Job descriptions are an established part of workplace formalities and were in place for 72.4% of men and 71.4% of women; conversely, 27.6% of men and 28.6% of women were expected to undertake their duties without the assistance of a job description. A related issue was that the relevance of many job descriptions was questionable with 62.0% of men and 58.2% of women indicating their job descriptions were a reasonable guide to their work. Performance appraisals were fairly common with 88.3% of men and 88.1% of women they were subject to appraisal and a comparatively high proportion of survey participants said their salaries depended on performance appraisals; 46.4% of men and 48.6% of women. Performance related salaries often were associated with larger organisations.

Formal promotion criteria were not common with 24.8% of men and 26.3% of women indicating that their employer had such criteria. Well defined career paths were also in a minority with 37.1% of men and 40.9% of women indicated these were in place in the organisations they worked in. Alternative career directions were more readily available with 58.1% of men and 38.9% of women identifying this option.

There was statistical evidence to support the view that women, especially those in the 40 to 49 years and 50 to 59 years age groups, participated less in organisational decision making. A surprisingly high proportion of women, 50.2%, said they never participated in decision making compared to 38.2% of men.

As was the case in 2007, flexible working arrangements made available to survey participants were widespread. The arrangements included in the survey covered all common arrangements like paternity/maternity leave, flexible hours and carers' leave and many were indicated as available by over 80% of survey participants. However, the take-up of these flexible working arrangements remains very low. Flexible hours were used by about two-thirds of participants but all other take-up rates were substantially lower than availability rates. The 2012 survey did not explore reasons for this difference but the comparative stability of the result over time is a matter for concern.

Continuous professional development is important in engineering and was made available to 70.7% of men and 71.1% of women. Conversely, about a third of participants did not have this facility. The proportion of participants who enjoyed career development opportunities unrelated to engineering was lower; 62.3% for men and 66.9% for women. Opportunities for continuous development and other training were even less available; 28.7% of men and

28.9% of women said that these opportunities were available while on paternity or maternity leave.

Responsibility for children and other dependents was more critical in some age groups than others and the level of responsibility was greater for women than men. Child care arrangements were problematic for about one quarter of survey participants. Although the proportion of survey participants who were responsible for the care of someone other than children was small, about two-thirds of this group said they did not have adequate care arrangements.

Survey participants overwhelmingly regarded a family friendly work place as important or very important; 74.3% of men were of this opinion and 81.2% of women. There was statistically significant evidence that at the aggregate level and for each age group, from the 20s to the 50s, women believed a family friendly working environment was more important than men.

# 5 WORKPLACE CULTURE

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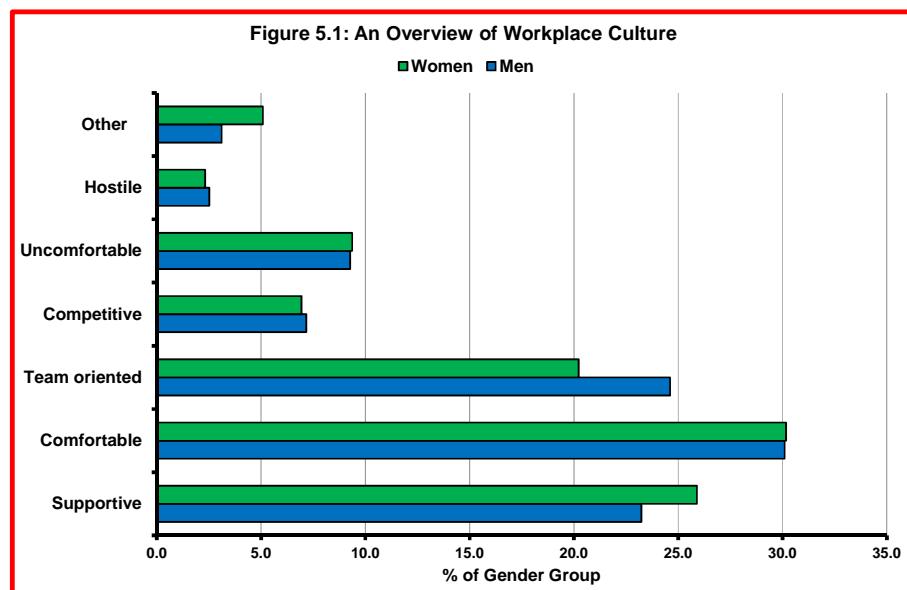
Workplace culture is the result of the interaction of several factors. This chapter begins by exploring the overviews offered by survey participants and then moves on to look in greater detail at their views about sexual harassment, discrimination and bullying. These are aspects of workplace culture that have been the subject of government legislation for over two decades and are seen as key elements in efforts to improve the gender balance in engineering.

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## 5.1 Workplace Culture, An Overview

Survey participants were asked for their impressions of workplace culture by selecting a description from a predetermined list, including supportive, comfortable, team oriented, competitive, uncomfortable, hostile and other. The responses are illustrated in Figure 5.1.

Productive workplaces are often associated with supportive and collaborative cultures and the survey options “supportive”, “comfortable” and “team oriented” capture the essence of these situations. While men and women ranked these options differently, overall 77.9% of men and 76.3% of men used this combination to describe their workplace cultures. In both cases, these proportions were higher in younger age groups and fell with age; for men from 82.3% in the 20s to 75.2% in the 50s and for women from 83.5% to 72.7% respectively. The proportions of men using these descriptions were highest (83.7%) in organisations with fewer than 10 employees and lowest (74.6%) in organisations with over 500 employees. There was no obvious difference in respect to organisation size for women.



Workplace cultures that are “uncomfortable” or “hostile” are not happy workplaces or conducive to productive work. Overall, 11.8% of men and 11.7% of women used these descriptions. They were less prevalent in younger age groups (9.5% for men and 8.4% for

women) and more prevalent in older age groups (13.5% for men and 11.0% for women in their 50s). The prevalence was higher in larger organisations than smaller ones for men (7.8% for less than 10 employees and 15.4% for over 500 employees) but no clear trend was evident for women in respect to organisation size.

Workplace cultures were described as “competitive by 7.2% of men and 6.9% of women. The prevalence of this description increased with age for both genders. It also increased with organisation size for men but once again there was no clear pattern for women.

## 5.2 Sexual Harassment

In 2004, the Australian Human Rights Commission reported that twenty years after legislation came into force, 28% of women had experienced sexual harassment in their workplaces compared to 7% of men<sup>39</sup>. This figure was remarkably similar to the results of the 1999 survey which reported that 27% of women engineers had been sexually harassed. The 2007 survey reported that the incidence of harassment had fallen to 22%, still one woman in five, compared to 2.8% for men. In the 2012 survey, sexual harassment was defined as any unwanted sexual advances or unwelcome conduct, suggestion or innuendo of a sexual nature.

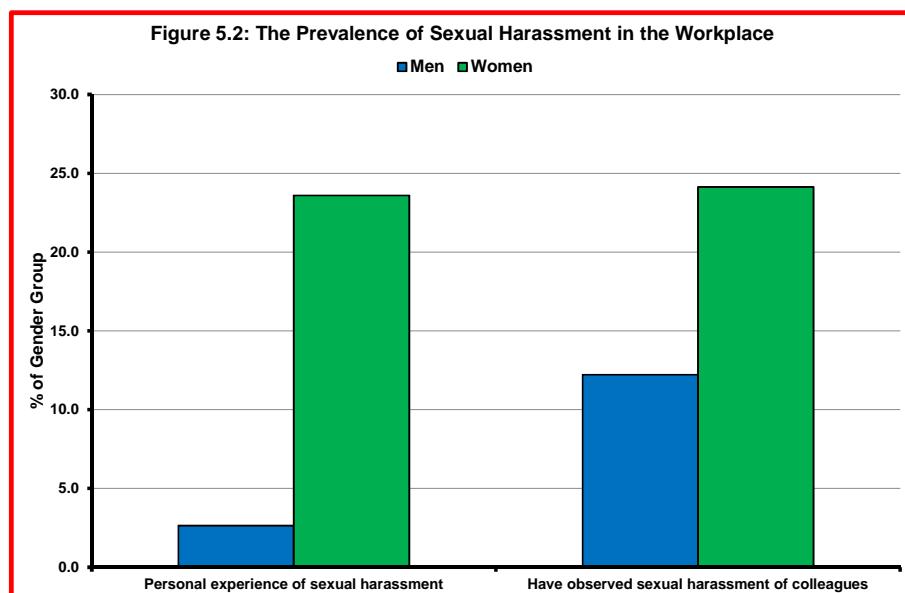


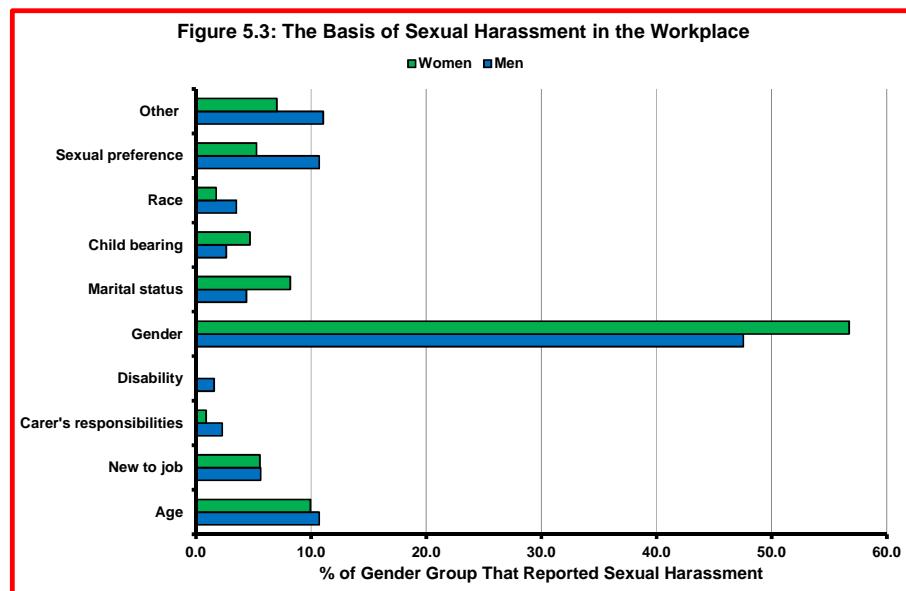
Figure 5.2 illustrates the incidence of sexual harassment for men and women and observations of sexual harassment of colleagues reported by survey participant. Little has changed in recent years with 23.6% of women reporting that they had personal experience of sexual harassment compared to 2.6% of men. A similar proportion of women (24.1%) observed colleagues being sexually harassed compared to 12.2% of men.

The incidence of sexual harassment is lower in the 20s age group but substantially higher in the next three age groups; in the 30s and 40s age groups, one in three women reported that they had been sexually harassed and in the 50s age group, 28.6% reported harassment. These figures are higher than reported to the Human Rights Commission eight years ago. In contrast the low incidence among men is consistent across age groups. Observations of colleagues being sexually harassed follow a similar age pattern as was the case for actual

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<sup>39</sup> Australian Human Rights Commission, “20 Years On: The Challenges Continue, Sexual Harassment in the Australian Workplace”, 2004, [www.humanrights.gov.au](http://www.humanrights.gov.au)

experiences but for men observations of colleagues being sexually harassed increase with age group from 8.1% in the 20s to 17.6% in the 60s age group.



Sexual harassment is primarily a gender based issue but several other factors contribute as shown in Figure 5.3. Survey participants who experienced or observed sexual harassment were asked to indicate the issue or issues that the harassment was based on (participants could elect more than one issue). Gender was identified by 47.5% of men and 56.7% of women as the basis of sexual harassment that was either experienced or observed. Age was identified by 10.7% of men and 9.9% of women; sexual preference by 10.7% of men and 5.3% of women; marital status was a key factor for women with 8.2% identifying it compared to 4.4% of men; being new to the job was identified by 5.6% of both men and women and child bearing was identified by 4.7% of women compared to 2.6% of men.

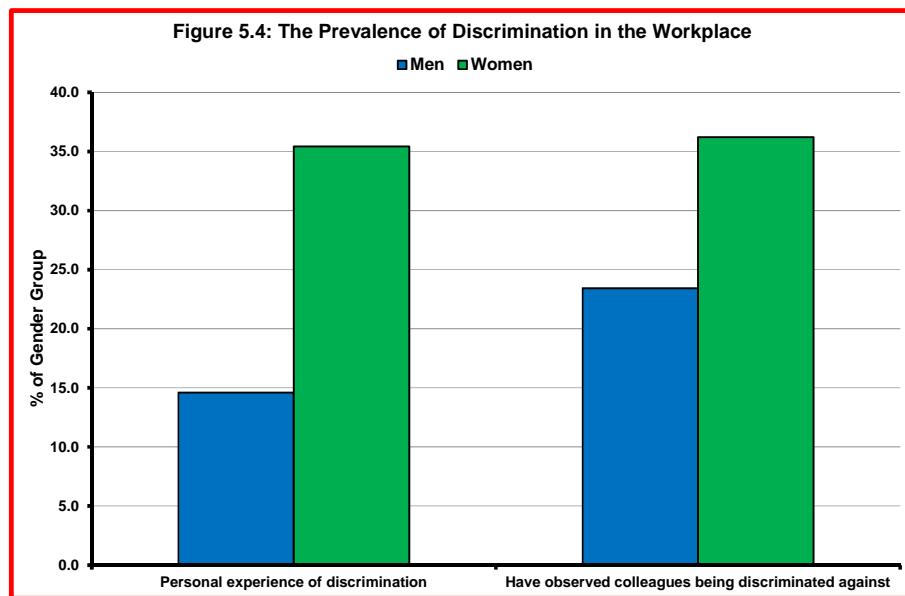
Gender figures strongly in the responses from all age groups but other factors change vary between age group, for example in the 40s age group, 13.6% of women identified age as the basis for sexual harassment, 9.1% identified new to the job and 10.6% marital status. In each case these responses are far higher than for women as a whole. For men in this age group, age was similar to the overall response but all other factors were much lower.

### **5.3 Discrimination**

In the survey, discrimination was defined as not being accorded equal access to workplace opportunity whether through gender, race, age, disability, marital status, child bearing or family responsibilities. The employment agency WorkPro surveyed equal employment opportunities in August 2008 and in June 2011<sup>40</sup>. In 2008, 24% of respondents reported that they had experienced discrimination and 35% had observed discrimination in the workplace. The 2011 results were almost a repeat of the earlier ones with 24% experiencing discrimination and 36% observing it.

In the 2007 CREW survey, 15.8% of men and 42.3% of women reported that they had experienced discrimination in the workplace. The 2012 survey shows that the prevalence of workplace discrimination remains high and there is still a large gender difference between men and women; 14.6% of men reported personal experience of discrimination, but over twice this proportion of women (35.4%) reported this unwanted experience (Figure 5.4).

<sup>40</sup> See [www.workpro.com.au/research](http://www.workpro.com.au/research)



Workplace discrimination increases with age. Among men in their 20s, 6.9% reported personal experience with workplace discrimination, increasing to 20.0% in the 60s age group. The lowest statistic among women exceeded the highest for men; 23.7% of women in their 20s reported personal experience of workplace discrimination, well over three times the prevalence for men in this age group. In the 30s age group, experiences of discrimination increases to 41.8% and to 44.1% in the 40s age group. Over half the women in the 50s age group (55.4%) reported experiences of discrimination.

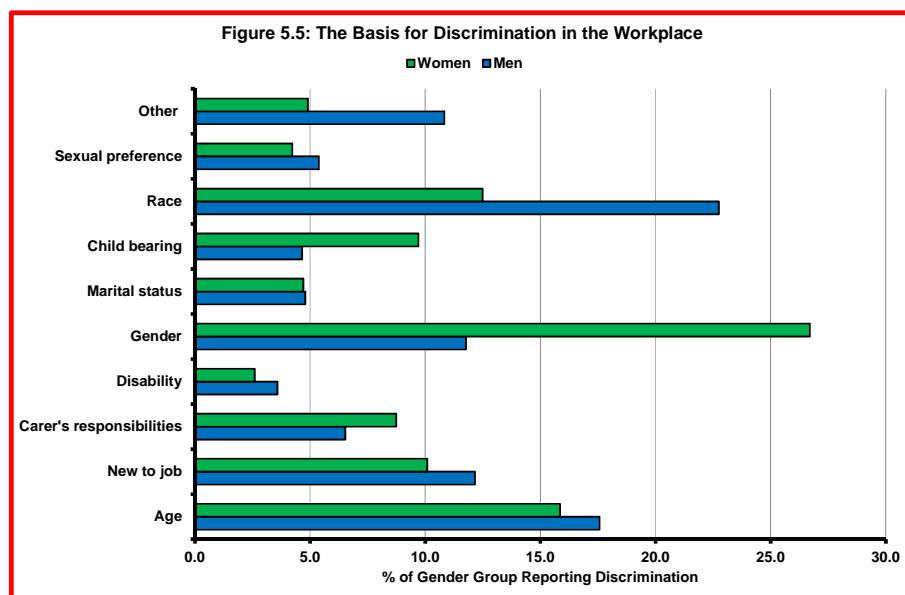


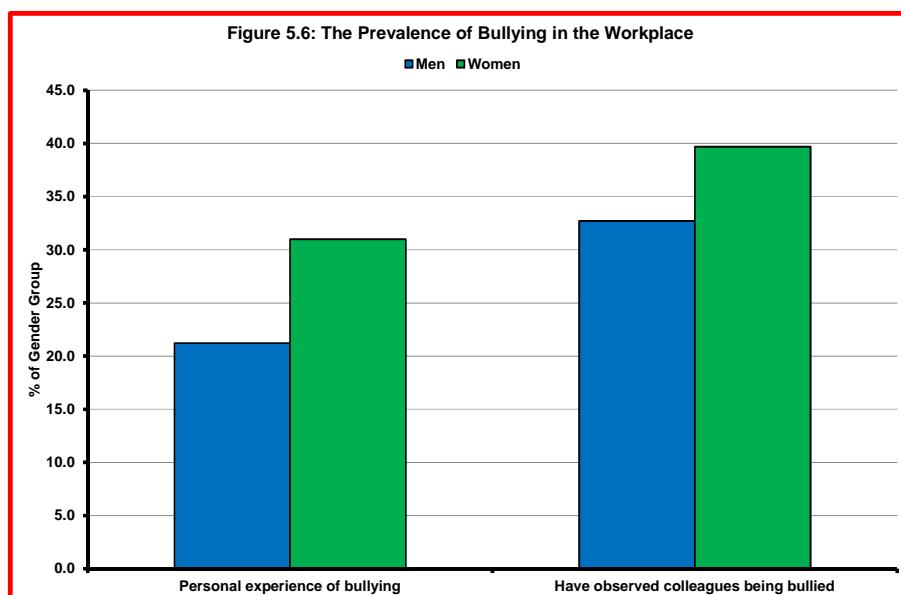
Figure 5.5 shows the many forms of workplace discrimination. Women are particularly affected by gender discrimination (26.7% compared to 11.8% for men), discrimination resulting from child bearing (9.7% compared to 4.7% for men) and carer's responsibilities (8.7% compared to 6.5% for men). Men are particularly affected by racial discrimination with 22.7% reporting this form of discrimination compared to 12.5% of women. There were several other forms of discrimination that affected men and women to a similar degree, including;

age discrimination (17.6% of men and 15.9% of women); discrimination against newcomers to the job (12.2% of men and 10.1% of women); disability (3.6% of men and 2.6% of women); marital status (4.8% of men and 4.7% of women) and sexual preference (5.4% of men and 4.2% of women).

Gender discrimination appears to be persistent across all age groups. Age discrimination is particularly high for men in the 20s age group (20.4%), reduces to below average over the 30s and 40s age groups and then increases to 25.7% for men in their 60s. Age discrimination for women is highest in the 30s age group (15.9%). Racial discrimination appears to be particularly an issue for men in their 20s (24.0%) and 30s (27.2%), the main target ages in skilled migration programs. Racial discrimination is relatively low for women in their 20s (8.4%) but increases with age group to 13.5% in the 50s age group. Being new to a job is a particular issue for men in their 20s (16.5%) and 30s (15.1%) and for women in their 30s (11.9%). Carer's responsibilities was a particular source of discrimination for women in their 30s (10.2%), 40s (10.4%) and 50s (13.5%) and men in their 40s (8.9%). Discrimination based on child bearing was particularly high for women in the middle age groups.

## **5.4 Bullying**

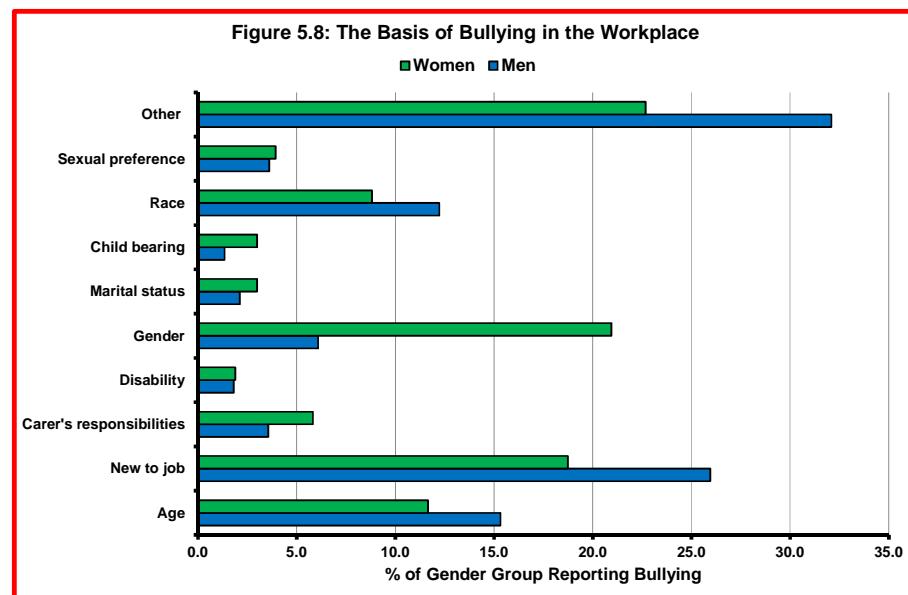
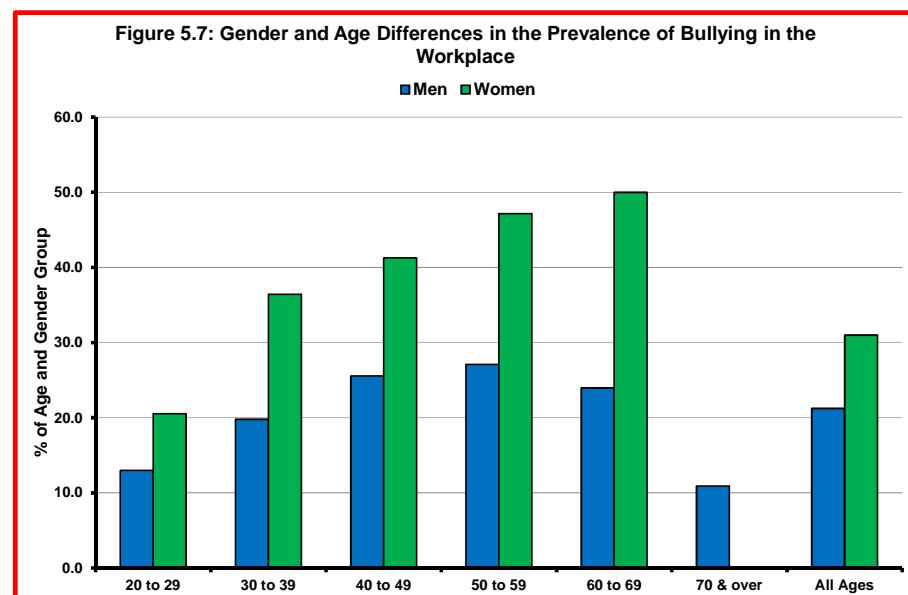
Background statistics suggest that bullying is widespread in Australian workplaces and there has been little or no improvement. In August 2008, the employment agency WorkPro reported that 30% of survey respondents said they had been bullied in the workplace and 44% had observed bullying in the workplace. A repeat survey in June 2011 produced responses of 28% and 43% respectively<sup>41</sup>.



In the 2012 Engineers Australia survey bullying was defined as the repeated unreasonable ill treatment of a person by another, consisting of offensive, abusive, belittling or threatening behaviour directed at an individual or group. The prevalence of workplace bullying has increased since 2007 with a large gender difference being maintained. In 2007, 18.6% of men and 28.2% of women said they had been bullied at work. In the 2012 survey, illustrated in Figure 5.6, these figures have increased to 21.2% of men and 31.0% of women as shown in Figure 5.6. Furthermore, 32.7% of men and 39.7% of women said they had observed colleagues being bullied.

<sup>41</sup> See WorkPro, op cit

Bullying is not just widespread but appears to be an age related phenomenon. This is graphically illustrated in Figure 5.7 which shows the prevalence of bullying by gender and age group. Even discounting the results for the 60s age group due to the small number of women, Figure 5.7 shows a widening gap between men and women from young to older age groups. The problem is not confined to women; over a quarter of men in their 40s and 50s said they had personal experience of bullying behaviour. The significance of the issue is compounded by results of 41.3% and 47.2% of women in these age groups saying they had personally experienced workplace bullying. Observations about colleagues being bullied are totally consistent with these age and gender pattern and are generally a few points higher.



The basis for bullying behaviour is complex with several factors involved as shown in Figure 5.8. Gender is a major issue for women; 6.1% of men said gender was the basis for bullying but 20.9% of women identified this factor. Being new to the job was identified by 26.0% of men and 18.7% of women as the source of bullying behaviour. Race (12.2% of men and 8.8% of women), age (15.3% of men and 11.7% of women), sexual preference (3.6% of men and 3.9% of women) and carer's responsibilities (3.6% of men and 5.8% of women) also are important considerations. What is particularly notable is the high result for "other" factors,

32.1% of men and 22.7% of women said that factors other than those listed in Figure 6.8 were the basis for bullying behaviour.

### 5.5 Key Points

This chapter considered issues related to the culture in engineering workplaces. The availability of external benchmark statistics is sketchy and further work to compare engineering to other areas of work is warranted. However, some statistics are available, including from regulatory authorities, and engineering survey results are now available for three waves, 1999, 2007 and now 2012.

Responses to general questions about workplace culture show that the vast majority of engineering workplaces have supportive, team oriented cultures conducive to productive working relationships. However, this was not universal and more specific questions point to problems that need to be addressed.

The prevalence of sexual harassment, discrimination and bullying in workplace is unacceptably high. When compared to benchmark statistics, the survey shows that the prevalence of these problems is at least as high in engineering as in Australia generally, higher in some cases. It was disappointing to find that two decades after legislation was enacted to address these problems, that there has not been more progress. In particular, there appears to have been little, if any, improvement since the 2007 survey.

Gender is an important underlying factor in sexual harassment, discrimination and bullying behaviour. Race, age and being new to the job are key factors in discrimination and bullying. In the case of bullying, a high proportion of responses was in the “other” category and given the large list of possible causes, suggests entrenched views.

In recent years the shortage of engineers has received considerable attention. But other Engineers Australia research has documented the fact that the demand for qualified individuals in other fields, has been at least as high, if not higher<sup>42</sup>. Research also shows that the proportion of individuals qualified in engineering who actually work in engineering jobs is about 60%, less in the case of women. It is difficult to escape the conclusion that the issues addressed in this chapter and the proportion of engineers working in engineering are unconnected.

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<sup>42</sup> Engineers Australia, The Engineering Labour Force, 2001 to 2010, [www.engineersaustralia.org.au](http://www.engineersaustralia.org.au)

### **APPENDIX 1: THE SURVEY QUESTIONNAIRE**

#### **1. WORKING ENVIRONMENT, FLEXIBILITY, JOB SATISFACTION AND ENGINEERING CAREERS**

Complete this survey for your chance to win a \$500 Coles-Myer gift Voucher.

All members of Engineers Australia (with at least Graduate status) are invited to participate in this 15 minute survey. A lot of the survey updates information gathered in 1999 and 2007 and published in the CREW reports available on Engineers Australia's web site.

However, since that first survey there have been many social developments involving working environment, workplace flexibility, job satisfaction and gender relationships relevant to both men and women and these are investigated as well.

Survey results will be analysed and published by Engineers Australia on its web site later in 2012.

#### **2. ABOUT YOU**

The following questions relate to personal particulars that can assist survey analysis.

1. What is your gender?

- Female
- Male

2. What is your age?

- 20 to 29 years
- 30 to 39 years
- 40 to 49 years
- 50 to 59 years
- 60 to 69 years
- 70 years and over

3. What is your Engineers Australia membership status?

- Professional Fellow
- Professional Member
- Professional Graduate
- Technologist Fellow
- Technologist Member
- Technologist Graduate
- Associate Fellow
- Associate Member
- Associate Graduate
- Hon Fellow
- Thank you. This survey applies only to EA members with at least graduate status. Please stop here.

4. What is your highest engineering related qualification?

- Doctorate
- Masters Degree
- Post Graduate Diploma or Certificate
- Bachelors Degree

- Associate Degree or Advanced Diploma
  - Other
5. In what year did you graduate with your FIRST qualification in engineering?
- 1985 or earlier
  - 1986 to 1990
  - 1991 to 1995
  - 1996 to 2000
  - 2001 to 2005
  - 2006 to 2010
  - Since 2010
6. When you obtained your FIRST engineering qualification, were resident in Australia or resident overseas?
- Resident in Australia
  - Resident Overseas
7. If you were resident overseas when you obtained your FIRST engineering qualification, when did you begin permanent residence in Australia? (SKIP this question if you were permanently resident in Australia when you obtained your first engineering qualification).
- 1985 or earlier
  - 1986 to 1990
  - 1991 to 1995
  - 1996 to 2000
  - 2001 to 2005
  - 2006 to 2010
  - Since 2010
8. To which Division of Engineers Australia is your membership attached?
- National Office (International Chapters)
  - Canberra
  - Newcastle
  - Sydney
  - Queensland
  - Northern
  - Victoria
  - Tasmania
  - South Australia
  - Western Australia
9. What is your most important Engineers Australia College affiliation?
- Civil
  - Structural
  - Biomedical
  - Chemical
  - Electrical
  - ITEE
  - Environmental
  - Mechanical
  - None

10. Do you have qualifications in a non-engineering field that is a higher level qualification than your highest engineering qualification? If you do, please indicate the field this qualification is in. (SKIP this question if engineering is your highest qualification).

- Science
- Education
- Management
- Accounting or Economics
- Other

### 3. EMPLOYMENT STATUS

This section explores your workforce status and the type of work you are currently doing. If you are not currently working as an engineer, the section explores whether you are working in another field and what you previously did when you worked as an engineer.

1. What is your labour force status?

- Employed Full Time
- Employed Part Time
- Unemployed and Looking for Full Time Work
- Unemployed and Looking for Part Time Work
- Retired from the Labour Force because you reached your retirement age
- Retired from the Labour Force for reasons other than age

2. If you are employed full time or part time, are you employed in engineering?

- Employed in Engineering Full Time
- Employed in Engineering Part Time
- Employed in Engineering Related Work Full Time
- Employed in Engineering Related Work Part Time
- Employed in Work Unrelated to Engineering Full Time
- Employed in Work Unrelated to Engineering Part Time

3. If you are presently working as an engineer or in engineering related work, what is the nature of your employment status? ( SKIP this question if you are NOT working in engineering or engineering related work).

- Permanent Full Time Salaried Position
- Permanent Part Time Salaried Position
- Casual Full Time Salaried Position
- Casual Part Time Salaried Position
- Contract Position with Full Time Hours
- Contract Position with Part Time Hours
- Owner/Operator of your Own Business with No Employees
- Owner/Operator of your Own Business with Employees

4. If you are not working as an engineer or in engineering related work, what is your employment status? (SKIP this question if you are working in engineering or engineering related work).

- Permanent Full Time Salaried Position
- Permanent Part Time Salaried Position
- Casual Full Time Salaried Position
- Casual Part Time Salaried Position
- Contract Position with Full Time Hours
- Contract Position with Part Time Hours
- Owner/Operator of your Own Business with No Employees

- Owner/Operator of your Own Business with Employees
5. If you are employed either full time or part time in engineering or engineering related work, what is your salary package (including superannuation, car and other benefits)? (SKIP this question if you are NOT employed in engineering or engineering related work).
- Less than \$60,000  
 \$60,001 to \$75,000  
 \$75,001 to \$90,000  
 \$90,001 to \$105,000  
 \$105,001 to \$120,000  
 \$120,000 to \$135,000  
 \$135,001 to \$150,000  
 \$150,001 to \$200,000  
 Over \$200,000
6. If you are employed full time or part time but NOT in engineering or engineering related work, what is your salary package (including superannuation, car and other benefits)? (SKIP this question if you are employed in engineering or engineering related work).
- Less than \$60,000  
 \$60,001 to \$75,000  
 \$75,001 to \$90,000  
 \$90,001 to \$105,000  
 \$105,001 to \$120,000  
 \$120,000 to \$135,000  
 \$135,001 to \$150,000  
 \$150,001 to \$200,000  
 Over \$200,000
7. If you are employed either full time or part time in engineering or engineering related work, how many hours do you work compared to the hours you are paid? (SKIP this question if you are NOT employed in engineering or engineering related work).

	Worked	Paid
1 to 15 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
16 to 24 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
25 to 34 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
35 to 39 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
40 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
41 to 48 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
49 hours and over per week	<input type="checkbox"/>	<input type="checkbox"/>

8. If you are employed either full time or part time BUT NOT in engineering or engineering related work, how many hours do you work compared to the hours you are paid? (SKIP this question if employed in engineering or engineering related work).

	Worked	Paid
1 to 15 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
16 to 24 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
25 to 34 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
35 to 39 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
40 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
41 to 48 hours per week	<input type="checkbox"/>	<input type="checkbox"/>
49 hours and over per week	<input type="checkbox"/>	<input type="checkbox"/>

9. If you are employed either full time or part time in engineering or engineering related work, how likely is it that you will leave your present job in the next 12 months? (SKIP question if you are NOT employed in engineering or related work).

- Very Unlikely
- Unlikely
- Undecided
- Likely
- Very Likely

10. If you are employed either full time or part time in engineering or engineering related work and are "likely" or "very likely" to leave your present job in the next 12 months, what are your reasons for leaving? (SKIP question if you are not employed in engineering or engineering related work or if you are undecided, unlikely or very unlikely to leave engineering or engineering related work).

*(Respondents were asked to rate each of the following reasons on a five point scale; very important, important, neutral, unimportant, very unimportant)*

- To obtain experience in a different aspect or field of engineering
- To specialise in your present field of engineering
- To obtain a higher salary and/or benefits in engineering
- To obtain a higher salary and/or benefits outside of engineering
- To obtain an engineering job with more opportunities to use my abilities
- To obtain an engineering job that offers more responsibilities
- To obtain a job outside of engineering that offers more responsibilities
- To obtain a job compatible with family responsibilities whether in engineering or not
- Limited or no opportunities for promotion
- Organisational management style
- More work variety
- Family responsibilities
- Personal reasons, including travel

11. If you are unemployed and looking for work, are you looking for work in engineering?

- Looking for Full Time Work in Engineering or Related to Engineering
- Looking for Part Time Work in Engineering or Related to Engineering
- Looking for Full Time Work but not in Engineering
- Looking for Part Time Work but not in Engineering
- Looking for any Full Time Work
- Looking for any Part Time Work

12. If you are presently not in the labour force, are you likely to return to engineering?

- Unlikely, I'm retired and no longer wish to work
- Unlikely, work other than engineering is more attractive
- Highly likely because I'm undertaking further studies in another field
- Unlikely because I'm undertaking further studies in another field to leave engineering altogether

#### **4. Experience in Engineering**

This section of the survey deals with your experience in engineering work. The first question should only be answered by you if you previously worked in engineering or engineering related work but presently do not, including if you are employed in another field, are presently unemployed or are not in the labour force. All other questions should be answered whether you are presently working in engineering or engineering related work or have previously worked in engineering or engineering related work.

1. If you do not presently work in engineering or engineering related work, how long has it been since you did?  
 10 years or more ago  
 5 to 9 years  
 1 to 4 years  
 Less than 1 year
  
2. In what industry is your present (or previous) engineering or engineering related work?  
 Agriculture  
 Mining, including Oil and Gas  
 Manufacturing  
 Electricity, Gas, Water and Waste Services  
 Construction  
 Wholesale, Retail Trade or Accommodation Services  
 Transport, Postal and Warehousing  
 Communications and Information  
 Financial Services  
 Professional Consultancy Services  
 Administrative Services  
 Public Administration and Defense  
 Education and Training  
 Health  
 Other
  
3. What type of enterprise is (was) the one you work (worked) for as an engineer or in engineering related work?  
 Private Sector Owner/Operator Business or Partnership  
 Private Sector Company  
 Educational Institution  
 Public Sector Corporation (including utilities)  
 Public Sector Department or Agency within a Department
  
4. What type of work do (did) you do?  
 Engineering management or supervision  
 Engineering technical and/or design work  
 A mixture of the two
  
5. How large is (was) the enterprise in which you worked as an engineer or in engineering related work?  
 Less than 10 employees  
 11 to 19 employees  
 20 to 50 employees  
 51 to 100 employees  
 101 to 500 employees  
 Over 500 employees

### 5. Work Satisfaction and Employment Conditions

The questions in this section explore your satisfaction with the engineering or engineering related work you are doing (previously did) and your views about the employment conditions that you worked under. You should respond to these questions whether you presently work in engineering or engineering related work or if you previously worked in engineering or

engineering related work, whether you are presently employed in other work, unemployed or not in the labour force.

*(There were 19 questions in this section and respondents were asked to give their answer to each question on a five point scale; Very Dissatisfied, Dissatisfied, Neutral, Satisfied, Very Satisfied).*

1. What is (was) your view about the physical work conditions including space, facilities, safety and environment?
2. What is (was) your view about the freedom you have (had) to choose your own method of working?
3. What is (was) your view about the flexibility you have (had) to choose your own working arrangements, including Part/Full Time, job sharing, flexible hours?
4. What is (was) your view about workplace colleagues?
5. What is (was) your view about the recognition you received for your work?
6. What is (was) your view about your immediate superior/supervisor?
7. What is (was) your view about the level of responsibility you are (were) given?
8. What is (was) your view about your salary?
9. What is (was) your view about the opportunities you are (were) given to use your abilities?
10. What is (was) your view about relations between employees and management in the enterprise?
11. What is (was) your view about opportunities for promotion?
12. What is (was) your view about the way your workplace is (was) managed?
13. What is (was) your view about the attention given to your suggestions?
14. What is (was) your view about your hours of work?
15. What is (was) your view about the degree of variety in your job?
16. What is (was) your view about your job security?
17. What is (was) your view about communications and the dissemination of information in your enterprise?
18. What is (was) your view about opportunities for paid staff development and/or training in your enterprise?
19. Taking into account all the issues raised above, what is your view about your (previous) job?

### 6. Performance Appraisal and Promotion

The questions in this section explore arrangements relating to performance appraisals and their links to promotion opportunities. These questions should be answered by you if you presently work in engineering or engineering related work or if you previously did, whether you are presently working in another field, unemployed or not in the labour force.

1. Does (did) your enterprise have a clearly written description for your job?  
 Yes  
 No
2. Is (was) your position description a good indicator of what you actually do (did) in your job?  
 Yes  
 No
3. Does (did) your enterprise apply a performance appraisal process?  
 Yes  
 No
4. Does (did) salary increases depend directly on the outcome of your performance appraisal?  
 Yes  
 No
5. Does (did) your enterprise have clearly written promotion criteria?  
 Yes  
 No
6. Is (was) there a well defined career path in your enterprise?  
 Yes  
 No
7. Does (did) your enterprise offer alternative career directions (including management and other fields of engineering)?  
 Yes  
 No
8. If there is (was) not a well defined career path in your enterprise, why is (was) this the case?  
 Flat Organisational Structure  
 Poor Personnel Management  
 Failure to Recognise Staff Ability  
 Organisation Too Small  
 Short Term Management Perspective  
 Other
9. How frequently do (did) you participate in enterprise decision-making?  
 Never  
 Sometimes  
 Most of the Time  
 Always

10. Do (did) you regard Engineering as a life-long career or as part of a more complex career path in which Engineering is an early transitional stage?
- Yes
  - No
  - Did not think far beyond finishing the course
  - Uncertain

### 7. The Flexibility of Employment Practices

This section explores how flexible were the workplace practices of enterprises, in particular in respect to the flexibility conducive to family friendly workplaces. You should answer these questions if you are presently employed in engineering or engineering related work or if you previously were so employed including if you are now employed in another field, are unemployed or not in the labour force.

1. Does (did) your enterprise offer?

	Yes	No
Flexible work hours	<input type="checkbox"/>	<input type="checkbox"/>
Job sharing	<input type="checkbox"/>	<input type="checkbox"/>
Part time work	<input type="checkbox"/>	<input type="checkbox"/>
Leave without pay	<input type="checkbox"/>	<input type="checkbox"/>
Carers leave	<input type="checkbox"/>	<input type="checkbox"/>
Paid maternity leave	<input type="checkbox"/>	<input type="checkbox"/>
Paternity leave	<input type="checkbox"/>	<input type="checkbox"/>

2. Does (did) you ever use the workplace facilities offered by your enterprise?

	Yes	No
Flexible work hours	<input type="checkbox"/>	<input type="checkbox"/>
Job sharing	<input type="checkbox"/>	<input type="checkbox"/>
Part time work	<input type="checkbox"/>	<input type="checkbox"/>
Leave without pay	<input type="checkbox"/>	<input type="checkbox"/>
Carers leave	<input type="checkbox"/>	<input type="checkbox"/>
Paid maternity leave	<input type="checkbox"/>	<input type="checkbox"/>
Paternity leave	<input type="checkbox"/>	<input type="checkbox"/>

3. Does (did) your enterprise offer CPD opportunities (technical information sessions) during normal business hours?

- Yes
- No

4. Does (did) your enterprise offer staff development opportunities unrelated to Engineering during normal business hours?

- Yes
- No

5. Does (did) your enterprise offer networking and/or CPD opportunities for employees on maternity/paternity leave?

- Yes
- No

6. Are (were) you responsible for the care of children while working?  
 Yes  
 No
7. How many children are (were) you responsible for while working?  
 One  
 Two  
 Three  
 More than three
8. Do (did) you have access to adequate child care other than yourself while working?  
 Yes  
 No
9. Do (did) you have responsibility for the care of someone other than your children while working?  
 Yes  
 No
10. Do (did) you have access to adequate care, other than yourself, for the person you are (were) responsible for while working?  
 Yes  
 No
11. Describe the work culture at your present (former) workplace?  
 Supportive  
 Comfortable  
 Team oriented  
 Competitive  
 Uncomfortable  
 Hostile  
 Other
12. In choosing your employment, how important to you is it that the enterprise offers a family friendly work environment?  
 Very important  
 Important  
 Neutral  
 Unimportant  
 Very unimportant

### **8. Harassment and Discrimination in the Workplace**

These questions explore sexual harassment and discrimination in the workplace. Sexual harassment is any unwanted sexual advances or unwelcome conduct, suggestion or innuendo of a sexual nature. Discrimination is not being accorded equal access to workplace opportunity whether through gender, race, age, disability, marital status, child bearing or family responsibilities. Bullying may be defined as the repeated ill treatment of a person by another consisting of offensive, abusive, belittling or threatening behaviour directed at an individual or group.

1. Have you personally experienced sexual harassment or observed colleagues being sexually harassed in your work as an engineer or in engineering related work?

Yes

No

Have personal experience

Have observed the experience  
of colleagues



2. Have you personally experienced discrimination or observed discrimination against colleagues in your work as an engineer or in engineering related work?

Yes

No

Have personal experience

Have observed the experience  
of colleagues



3. Have you personally experienced bullying or observed colleagues being bullied in your work as an engineers or in engineering related work?

Yes

No

Have personal experience

Have observed the experience  
of colleagues



4. If you have observed discrimination in the workplace either personally or to your colleagues in your work as an engineer or in engineering related work, what issue(s) was it based on? (More than one response may be chosen).

Sexual harassment

Discrimination

Bullying

Age




New to job




Carer's responsibilities




Disability




Gender




Marital status




Child bearing




Race




Sexual preference




Other



