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# Electricity Supply Sector Workforce Forecast 2010-20

## (Summary)

Report Prepared For:

Electricity Supply Industry Training Organisation (the ESITO)

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## Revision Log

<b>Report Extension</b>	<b>Description</b>	<b>Issue Date</b>
final_rv2	From report version final_rv2	14 August 2009



## Executive Summary

This report describes forecasting workforce numbers in the New Zealand electricity sector for the period 2010 to 2020 (ten years).

This report reflects our opinion of the matters before us given the information available to us and the time frame in which we were able to consider that information. However, we note that the data is not complete, especially from the company returns.

Caution is noted in that the methodology used is particularly sensitive to the accuracy of the make-up of the current workforce as the percentage drivers of growth and attrition are determined then applied against the present skill and sector numbers to derive the forecast changes. As the present workforce numbers are only determined approximately, the results presented here must be considered as “indicative only” at this time. It is noted that this is the first issue of this report in this format and deficiency in the data is recognised. With the co-operation of the industry, it is hoped future revisions of this report will improve in this respect.

This report develops and executes a methodology for forecasting the training requirements in the electricity supply industry. It is principally based on the assessment of two aspects, attrition from the existing workforce and the requirement for new positions due to growth in the physical work required.

Attrition, which includes loss to retirements, is considered by analysis of the historic progression of the demographics reported in successive census returns. Issues of productivity are also considered through this same analysis.

Work volume changes are assessed on a sector basis (generation, transmission and distribution, and with retail activities included in the generation sector) from either direct correlation to underlying economic drivers, or through the assessment of forecasts by others, in particular the Electricity Commission for the generation forecasts and Transpower for its own internal forecasts of opex and project labour requirements in the transmission sector.

### **Summary of conclusions:**

1. Our model of net loss, derived from a demographic assessment of attrition and a sector analysis of future work volumes based on economic drivers, appears roughly correct as the per annum deficit is in keeping with the current training output plus an assessment of net migration into the industry.
2. No significant productivity changes are foreseen in the trades and professional skill groupings, although a continuance in the short term of productivity improvement in the administration area, at the level that is evident historically, is assumed in our models.
3. Attrition shows as the most significant factor for loss from the industry. The rate of attrition is forecast to be most acute in the professional groupings due to the higher age of the mode of the age profile for this group.
4. Levels of net migration is not considered as a key factor as it is largely self-controlling, although, as it derives from the difference of large numbers (immigration and emigration) this aspect needs to be monitored and in particular emigration out of the sector and the continued ability to secure skilled persons from overseas.



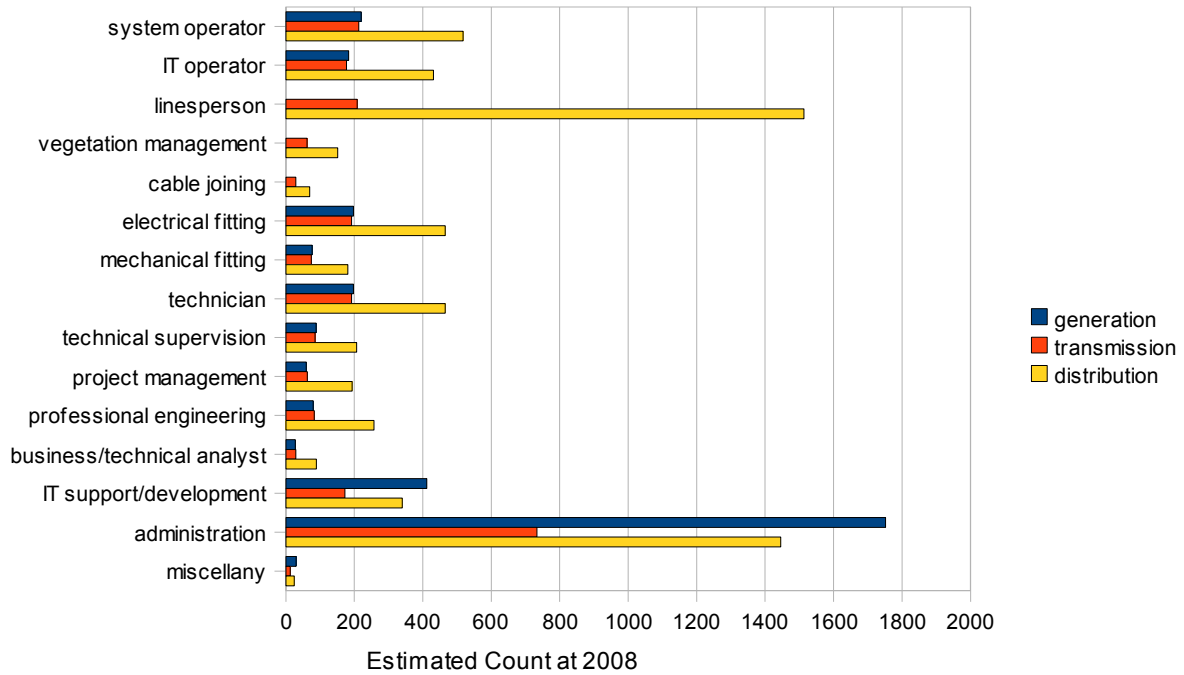
5. The work volume models are most sensitive to variance in the GDP forecast as this is the key driver of the energy demand forecast and network extension and is highly correlated to population numbers which affects distribution network customer numbers.
6. The ageing of distribution networks is not considered a significant factor in the distribution network work volumes being forecast, based on current evidence.
7. The risk around net deficit or surplus of trainees given the current training output under variance in the growth forecasts is invariably on the deficit side, as the reduction in the work volumes under the low GDP scenario is less than the assumed present level of migration into the industry and is therefore controllable. Under the high growth scenario, a net deficit of approximately 110 persons p.a is estimated.
8. The future issues appear not to be around training more or less persons, but in meeting the changing skills requirement, particularly the training of transmission linesmen (largely due to a combination of work and Transpower training policy changes), the increasing requirement for mechanical skills as the generation portfolio shifts towards more wind, geothermal and thermal fuel types, and the evident increase in the IT skills requirement.

### **Summary of Recommendations:**

1. There is much uncertainty about the true nature of the current workforce in both total numbers and the splits by sector and skill. Further detailed investigation of the current numbers, skills and demographics of the industry is strongly recommended.
2. The evolving nature of the migration to and from the industry should be monitored on a regular basis. This may require specific metrics to be developed in this area and measured and reported on a regular basis.
3. The management of attrition in all sectors of the industry needs to be promoted as a key focus going forward.

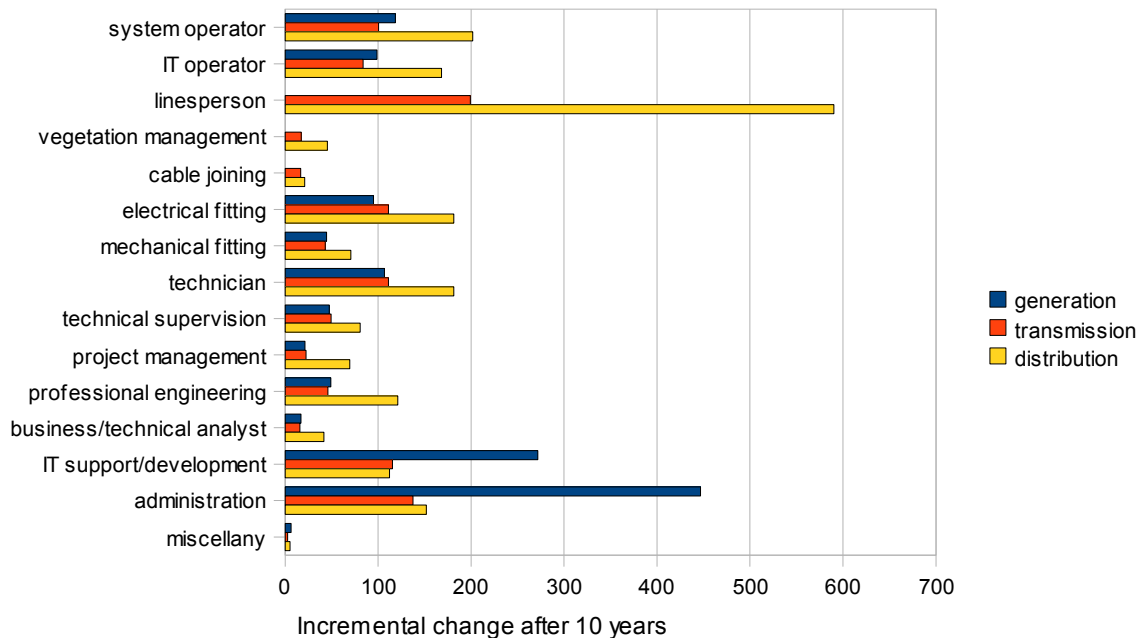
### **Summary of Information**

The present disposition of workforce numbers is illustrated in the following chart and is based on the estimation methods discussed within this report. Caution on the accuracy of this information is again emphasised; later issues of this report will include data based on industry survey returns and provide a better platform to project future changes.

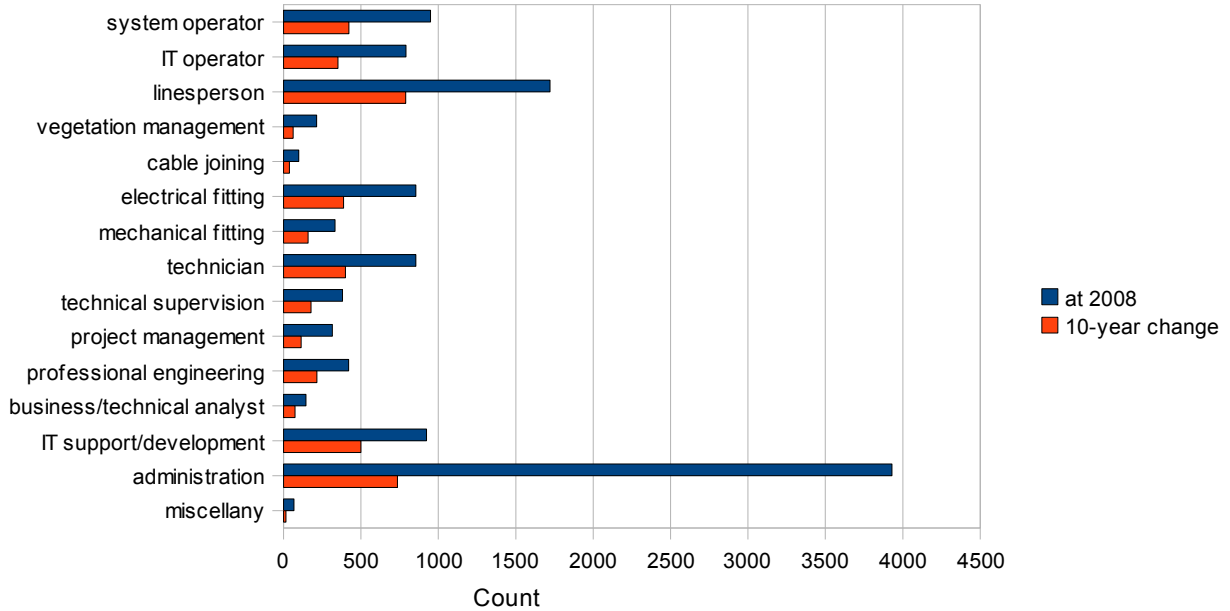


The results of our modelling are illustrated in the following charts:

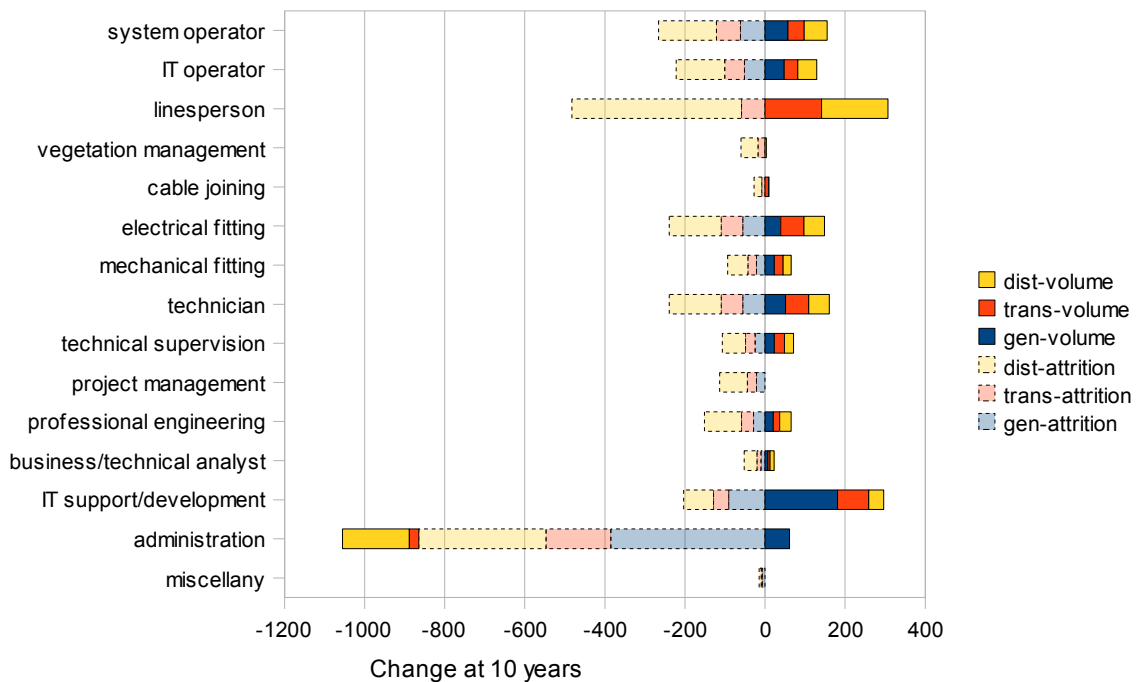
**Cumulative number of positions by skill and sector required over 10 years [showing linespersons, administration and IT as key skill areas]**



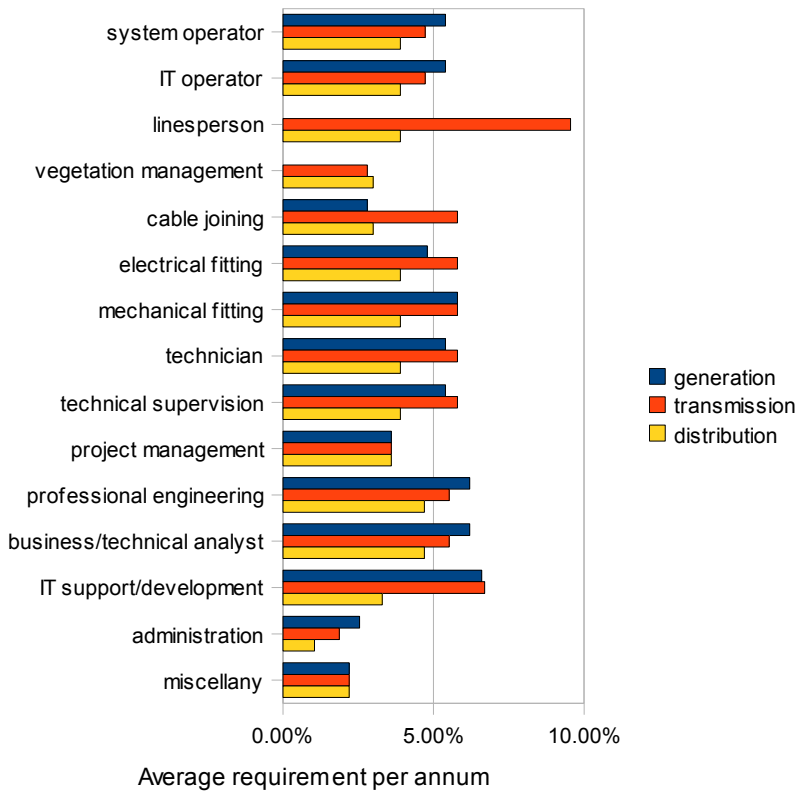
**Cumulative number of positions required by skill over 10 years in comparison to current numbers** [showing the future requirements are not exactly in proportion to the current numbers and therefore the skills training mix may need to shift]



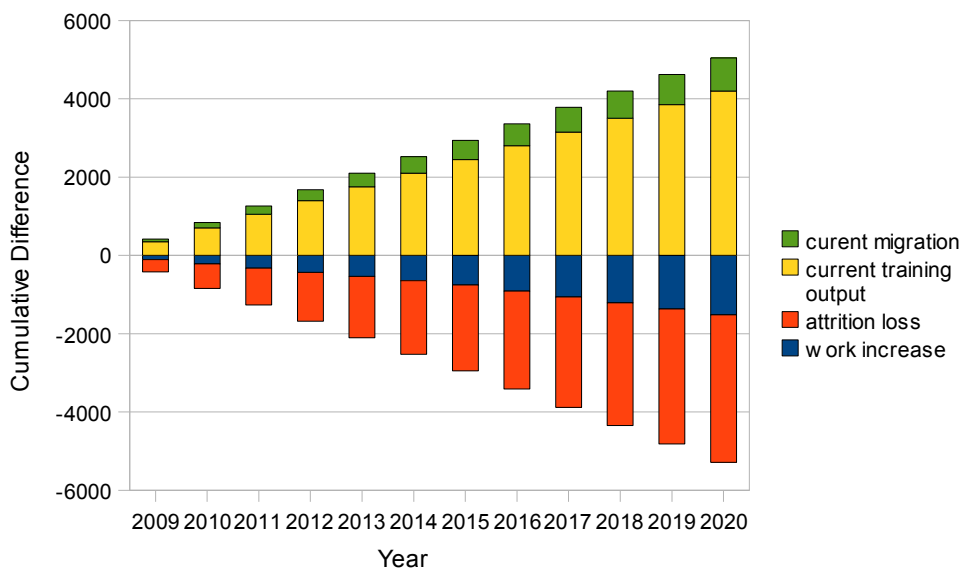
**Breakdown of 10-year cumulative requirement by skill, sector, and driver** [showing that attrition is the key driver]



**Average per annum increase by skill and sector as percent** [showing the generation and transmission sectors having the greatest need for skills development (on a relative basis)]

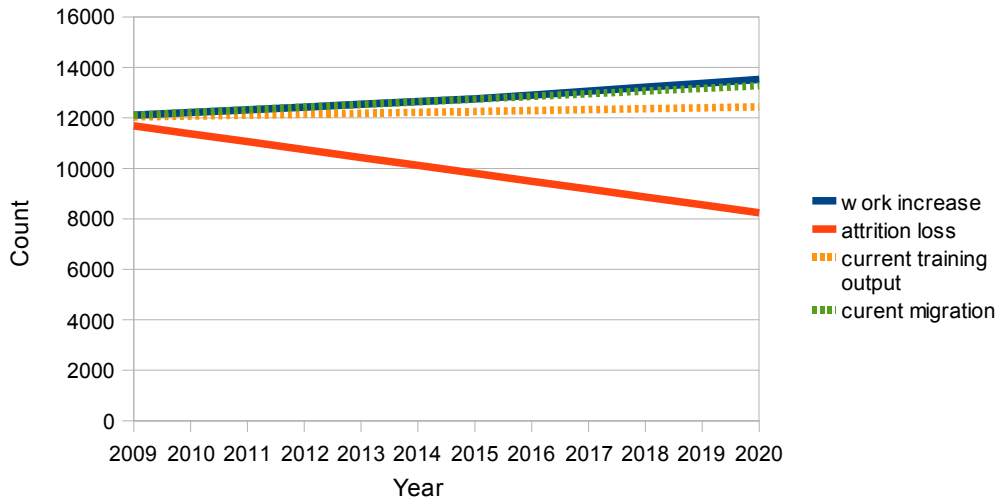


**Match of cumulative total deficit (attrition and work volume) against supply (training output and net migration)** [showing that attrition is the key deficit driver; that net migration is not a key supply issue; and that the net difference is small]

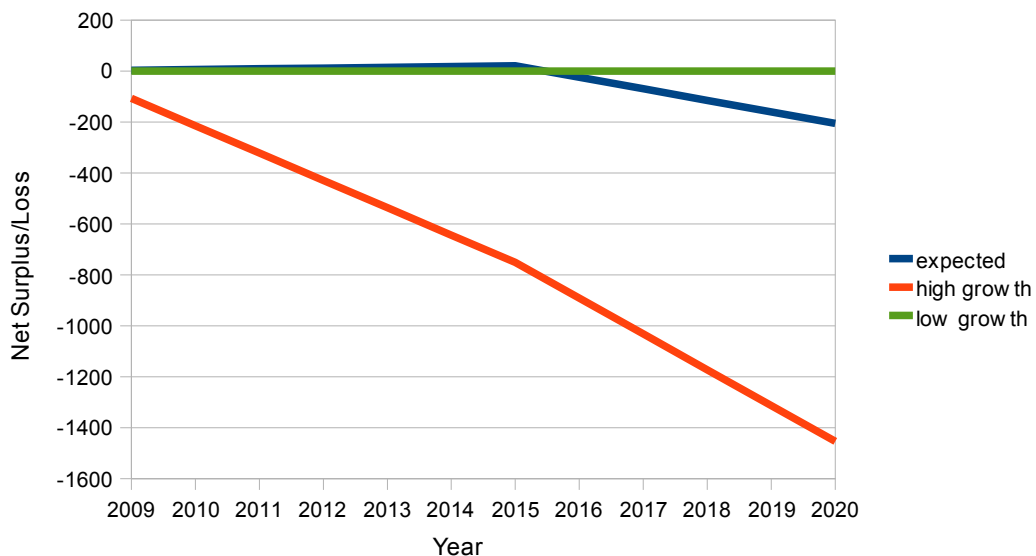




**Cumulative workforce numbers showing attrition and work volume projecting separately off the current workforce numbers and the training make-up though current training output and estimated current net migration** [again showing that attrition is the key deficit driver; that net migration is not a key supply issue; and that the net difference is small]



**Cumulative forecast of net difference (supply – deficit) under low, expected and high growth scenarios** [showing the risk is on the deficit side]



The expected per annum requirement by skill class is set out in the following table and compared to the current training output.



<b>Class</b>	<b>Requirement p.a.</b>	<b>Current Output p.a.</b>
system operator	42	26
IT operator	35	unknown
linesperson	82	105
vegetation management	6	
cable joining	4	25 (large difference noted for further analysis)
electrical fitting	39	30
mechanical fitting	16	11
technician	40	25
technical supervision	18	From pool of trained technicians and fitters
project management	11	unknown
professional engineering	22	20
business/technical analyst	7	unknown
IT support/development	53	unknown
administration	45	unknown
miscellany	1	n/a
<b>Sum p.a.</b>	<b>417</b>	<b>350</b>





## Appendix 2 – Skill Classes

The following table allocates the census occupational classes into the skill groups used in this review.

<b>Group</b>	<b>Skill Class</b>	<b>Reference</b>	<b>Occupation Class</b>
A	system operator duties	81611	Power Generating Plant Operator
A	system operator duties	81541	Other Chemical Processing Plant Operator
A	system operator duties	81211	Metallic Furnace Operator
A	system operator duties	81522	Water Treatment Plant Operator
A	system operator duties	81612	Boiler Attendant
B	linesperson duties	82923	Linesperson
C	vegetation management duties	0	none
C	vegetation management duties	32121	Agricultural Technician
D	cable joining	0	none
E	electrical fitting	82924	Electric Cable Joiner
E	electrical fitting	72411	Electrical Fitter
E	electrical fitting	71311	Electrician
F	mechanical fitting	72231	Fitter and Turner
F	mechanical fitting	72124	Fitter and Welder
F	mechanical fitting	84112	Pipe Fitter
F	mechanical fitting	72311	Machinery Mechanic
F	mechanical fitting	72314	Heating, Ventilation and Refrigeration Mechanic
F	mechanical fitting	82111	Machine Tool Operator
F	mechanical fitting	72123	Boiler Maker
G	technician duties	31131	Electrical Engineering Technician
G	technician duties	31151	Mechanical Engineering Technician
G	technician duties	31143	Other Electronics Engineering Technician
G	technician duties	31191	Other Engineering Technician
G	technician duties	31111	Physical Science Technician
G	technician duties	31161	Chemical Engineering Technician
G	technician duties	31192	Non-Destructive Testing Technician



G	technician duties	72421	Electronics Servicer
H	technical supervision	12219	Engineering Technical Manager
H	technical supervision	12213	Production Manager (Manufacturing)
H	technical supervision	12218	Construction Manager
H	technical supervision	31516	Quality Inspector
H	technical supervision	12282	Quality Assurance Manager
H	technical supervision	31123	Clerk of Works
H	technical supervision	72316	Mechanical Products Inspector and Tester
H	technical supervision	31511	Safety Inspector
I	project management	0	none
J	professional engineering	21431	Electrical Engineer
J	professional engineering	21455	Other Mechanical Engineer
J	professional engineering	21426	Other Civil Engineer
J	professional engineering	21461	Chemical Engineer
J	professional engineering	21425	Structural Engineer
J	professional engineering	21441	Electronic and Telecommunications Engineer
J	professional engineering	21423	Public Health Engineer
J	professional engineering	21142	Geophysicist
J	professional engineering	21131	Chemist (other than Pharmacist)
J	professional engineering	22117	Environmental Scientist
J	professional engineering	12281	Research and Development Manager
J	professional engineering	21141	Geologist
J	professional engineering	21451	Heating, Ventilation and Refrigeration Engineer
J	professional engineering	21481	Surveyor
J	professional engineering	33634	Industrial Designer
K	business/technical analyst duties	33241	Organisation and Methods Analyst
K	business/technical analyst duties	24422	Policy Analyst
K	business/technical analyst duties	24131	Market Research Analyst
K	business/technical analyst duties	21412	Resource Management Planner
K	business/technical analyst duties	12281	Research and Development Manager



L	IT support/software development duties	21313	Systems Manager
L	IT support/software development duties	31213	Computer Support Technician
L	IT support/software development duties	21311	Systems Analyst
L	IT support/software development duties	31141	Telecommunications Technician
L	IT support/software development duties	31142	Computer Systems Technician
L	IT support/software development duties	31211	Computer Programmer
L	IT support/software development duties	12271	Information Technology Manager
L	IT support/software development duties	24322	Information Services Administrator
L	IT support/software development duties	31143	Other Electronics Engineering Technician
M	administration/legal/accounts/regulatory duties	12222	Administration Manager
M	administration/legal/accounts/regulatory duties	41443	General Clerk
M	administration/legal/accounts/regulatory duties	12111	General Manager
M	administration/legal/accounts/regulatory duties	41213	Costing Clerk
M	administration/legal/accounts/regulatory duties	24133	Financial Adviser
M	administration/legal/accounts/regulatory duties	41211	Accounts Clerk
M	administration/legal/accounts/regulatory duties	24111	Accountant
M	administration/legal/accounts/regulatory duties	12291	Office Manager
M	administration/legal/accounts/regulatory duties	12224	Finance Manager
M	administration/legal/accounts/regulatory duties	33211	Administration Officer
M	administration/legal/accounts/regulatory duties	41141	Secretary
M	administration/legal/accounts/regulatory duties	11311	Chief Executive and/or Managing Director



M	administration/legal/accounts/regulatory duties	41311	Stock Clerk
M	administration/legal/accounts/regulatory duties	12231	Human Resources Manager
M	administration/legal/accounts/regulatory duties	24121	Human Resources Officer
M	administration/legal/accounts/regulatory duties	41221	Finance Clerk
M	administration/legal/accounts/regulatory duties	41321	Material and Production Planning Clerk
M	administration/legal/accounts/regulatory duties	41445	Human Resources Clerk
M	administration/legal/accounts/regulatory duties	42213	Information Clerk and Other Receptionist
M	administration/legal/accounts/regulatory duties	41111	Typist and Word Processor Operator
M	administration/legal/accounts/regulatory duties	24231	Other Legal Professional
M	administration/legal/accounts/regulatory duties	24211	Barrister and Solicitor
M	administration/legal/accounts/regulatory duties	24132	Public Relations Officer
N	IT application operator duties [specifically GIS, CAD, and CMMS]	21312	Computer Applications Engineer
N	IT application operator duties [specifically GIS, CAD, and CMMS]	31181	Draughting Technician
N	IT application operator duties [specifically GIS, CAD, and CMMS]	41121	Data Entry Operator
N	IT application operator duties [specifically GIS, CAD, and CMMS]	31212	Computer Operator
O	miscellany	99999	miscellany