

BC AEROSPACE WORKFORCE DEVELOPMENT PLAN

APPENDIX 2: Supply Of Skilled Workers Through BC Educational Institutions

December 15, 2002

- In the following table, **anticipated demand numbers** are brought forward from the analysis completed by labour market economist Ruth Emery for the BC Aerospace Workforce Strategy steering committee.

PLEASE NOTE that these demand numbers are NET GROWTH ONLY – EXCLUSIVE OF ATTRITION from age-related retirement and exclusive also of exits of workers to other industries and/or jurisdictions outside of British Columbia. Re: the latter, the national HR study conducted by the Canadian Aviation Maintenance Council (CAMC) in 2002 discovered that though the mobility of the aerospace workforces is weak in Winnipeg, Atlantic Canada and Quebec – BC and Ontario have highly mobile workforces.

- In the table, **anticipated supply numbers** are brought forward from the source data that was captured in *Producing Productive People: Examining the supply of training for skilled workers in BC's Aerospace Industry*, the technical report produced by consultant John Appleton for the BC Aerospace Workforce Strategy steering committee. (Final version distributed to the Steering Committee on September 17, 2002 is the version used in this summary. Supply numbers quoted in the Executive Summary of that report are not used because arithmetic errors were found. For example, in some cases, demand for a particular type of technician was entered in more than one occupational category in the summary table, thereby skewing the assessment of total demand. In the table below, the original numbers of graduate output that were provided by post-secondary educational institutions to researcher John Appleton are used – with adjustments made in every occupational category in accordance with the methodology description that follows – see steps 5-6-7 below.)

- **Methodology for calculating supply numbers**

To calculate total supply for each of the following occupational groups, the following methodology was used:

1. Only the graduates of aerospace technical training programs that are delivered by post-secondary educational institutions who have met Transport Canada approval requirements and achieved ATO (Approved Training Organization) status are included.

NOTE: Where another BC training provider is also offering programs to prepare learners for work in a specific occupational category, but that training provider does not yet have ATO status with Transport Canada (*such as the University College of Fraser Valley with its program for Aircraft Structures Technicians*), the number of additional graduates is noted as a qualifier in the 3rd column that shows anticipated gap. This is because without ATO status for the provider, the program does not fall into the “approved” category of aerospace training, and graduates are not assured that they will (through this program) be earning credits that can be applied towards AME license requirements. (Individual learners *may*, subject to review and approval on a case-by-case basis with Transport Canada inspectors, earn credits towards AME licensure through non-ATO programs – but they are not *guaranteed* that outcome.)

2. Only the graduate supply from ATO organizations *in British Columbia* have been factored into the supply total in this table. That restricts supply numbers in column 2 to graduate output from BC Institute of Technology (BCIT) and Northern Lights College (NLC) aerospace programs in Richmond and Dawson Creek, respectively.
3. Supply is based on *current funded program capacity*. It is recognized that for some programs, current funded capacity can be less than the total intake capacity for a given educational institution.

4. Current output is assumed to stay constant. I.e., no allowance for program expansion and increased output (e.g., as a result of higher funding to the educational institution) is factored into the cumulative supply for the four-year period referenced in the table below.
5. The anticipated number of *graduates* (not registrants) is used. The source data in the Appleton report is, in most cases, accompanied by the rate of dropouts between enrollment and graduation. (The dropout rate for aerospace programs varies but is typically in the range of 8-11%.) The total output identified in source data tables as “current funded program capacity” is first adjusted so that it is net of dropouts between program intake and program completion.
6. The total graduate output has been further adjusted to reflect the proportion actually *available for employment*. Ninety-two percent (92%) is used as the proportion of graduates available for aerospace employment, since it is understood from college sources and also from student outcomes data from the provincial government’s Centre for Educational Information, Standards and Statistics (CEISS) that this is the proportion of aerospace program graduates who seek – and are successful in securing – employment that is directly related to their field of education and training. Other graduates (the other 8%) may have applied to but been found unsuitable by aerospace employers. OR they may have simply chosen to seek employment in a different industry. OR they may have instead gone on to other studies, travel, or to pursue other activities following graduation.
7. The supply of graduates available for aerospace employment is further adjusted to take into account one other factor. Ninety percent (90%) of the adjusted total supply of graduates (i.e., total supply of new job candidates for aerospace employers) is used as the supply that is likely to be available to *BC employers* in the aerospace industry. This adjustment has been made because key contacts in post-secondary educational institutions indicated that their student outcome records show that typically, 90% of the graduates who secure employment take jobs in the industry in BC and the other 10% accept work in other provinces or other countries.

To illustrate, if the supply of potential graduates is 20 from one provider and 10 from another, and if the dropout rate for the first program is 8% and for 10% for the second, then total supply for a particular occupation in a given year is calculated as 92% of 20 plus 90% of 10 – or $18 + 9$ which is 27 for the year.

Over a 4-year period then, the total supply is assumed to be 108.

The supply available for aerospace employers is assumed to be 92% of the total supply – which in this example means 92% of 108 – or 99.

The supply available for BC aerospace employers is assumed to be 90% of the supply available for employment (adjusted total) – which in this example means 90% of 99 – or 89.

In this fashion, the total funded capacity is adjusted from 120 over a 4-year period to 89 over the same period.

- When anticipated increases in the demand for skilled workers are contrasted with anticipated supply of graduates from relevant training programs that are delivered by BC colleges, the net result, *exclusive of attrition-related needs*, is:

Occupation	Minimum demand based on new employment growth	Anticipated supply from ATO sources in British Columbia	Anticipated gap * before factoring in attrition-related needs
	2001-2005	4-year supply based on 2000 graduate levels	
AME – M	158		Surplus of 436 – but subject to provision of OJT training by employers – and <i>before</i> attrition considered
Maintenance Technician	50	644	
AME – S	100		Potential surplus of 33 (plus 236 from UCFV but UCFV without ATO status as of December 2002) – <i>before</i> considering attrition – and subject to provision of OJT training by employers
Structures Technician	55	188	
AME – E	73		Shortage of 5 AME-Es <i>before</i> considering attrition – and subject to provision of OJT training by employers
Avionics Technician	24	92	
Gas Turbine Engine Repair Technician	71	144	Surplus of 73 <i>before</i> considering attrition – and subject to provision of OJT by employers
Aircraft Structures Manufacturing Technician (Fabrication)	51	~ 105 ¹	Surplus of 54 <i>before</i> considering attrition
Aviation Machinists	18	See note below	Shortage of 18 <i>before</i> considering attrition
Helicopter Dynamic Component Techs	28	Unknown	Indeterminate

¹ The supply of **Structures Manufacturing Technicians (ASMs)** through college programs in BC is known to be small. No data on relevant programs or student capacity was provided by educational institutions during the labour supply research project commissioned by the Aerospace Workforce Strategy. Since that time, however, it has been learned that BCIT offers 2 classes per year, with 16 students accepted into each. In this occupational category, no adjustment has been made for dropouts between registration (program intake) and program completion because the rate is unknown. The total supply of 32 graduates per year has been adjusted to take into account probable movement of graduates into non-aerospace environments and/or jurisdictions other than British Columbia, using the same planning assumptions as those noted in steps 6 and 7 above.

- * **PLEASE NOTE that this rudimentary estimate of shortage (or surplus) DOES NOT FACTOR IN ATTRITION.**
- * **Shortage or surplus calculation (column 4) ALSO ASSUMES that all available supply (column 3) are hired by BC employers.**
- * **ALSO ASSUMES that companies keep these grads employed long enough to enable them to earn on-the-job training credits needed to complete certification or licensure requirements**
- REFERENCE PAGES in Appleton report² that were used to calculate total supply in the table above, following the methodology noted in this appendix, are:
 - Aircraft Maintenance Technician Pages 52 – 53
 - Aircraft Structures Technician Pages 55 – 56
 - Avionics Technician Pages 50 – 51
 - Gas Turbine Engine Repair Technician Page 66
 - Aircraft Structures Fabrication *See footnote on preceding page of this appendix*
 - Helicopter Dynamic Component Technician *No data available in Appleton reports*

NOTE: There is no BC college grad supply of **Aviation Machinists** – so cross-training becomes an important consideration, e.g., through such skill assessment and placement services as T.R.A.D.E.S.

- **Recognizing that attrition could effectively double the demand** (since net employment growth for 2001-05 is estimated to be positions for 700 skilled workers – and 332-700 additional positions are likely to become available because of age-related retirement or other attrition), it appears that **the two areas in which the projected supply is most likely to be inadequate are (1) AME-S and Aircraft Structures Technician group, and also (2) AME-E and Avionics Technician group.**
- The pivotal challenge in meeting the anticipated skill shortage (from a quantitative perspective) is that of aerospace companies individually and collectively ensuring sufficient “take-up” of these basic training graduates. Aerospace employers must also support these novice employees long and well enough to enable them to acquire the necessary on-the-job training (OJT) credits for licensure as AMEs.

Historically, the preferred ratios of experienced : novice workers that employers hold, combined with market-driven fluctuations in project demands, have driven employers to keep their “take-up” of basic training grads to lower levels than is optimal for development of the size of skilled workforce that they foresee needing.

² *Producing Productive People: Examining the supply of training for skilled workers in BC's Aerospace Industry – Technical Data* (hard copy delivered to Steering Committee members on September 17, 2002 but dated Spring 2002), a report by DBAPPLETON STRATEGIC PERFORMANCE DEVELOPMENT; principal researcher and writer = John Appleton