BRITISH COLUMBIA AEROSPACE INDUSTRY SECTOR LABOUR MARKET PARTNERSHIP

FINAL ENGAGEMENT REPORT
NOVEMBER 2016

PREPARED BY

AIAC PACIFIC

Aerospace Industries Association of Canada

L'Association des industries aérospatiales du Canada

Canada

BRITISH COLUMBIA

Funding provided through the Canada-British Columbia Labour Market Development Agreement.

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Introduction

In August 2016, the Aerospace Industries Association of Canada (AIAC) entered in to an agreement with the Province of British Columbia, Ministry of Jobs, Tourism & Skills Training and Responsible for Labour, to conduct a Sector Labour Market Partnerships Program project focusing on the British Columbia Aerospace sector. The purpose of the project is to bring together organizations within British Columbia's aerospace sector to achieve clear consensus and direction on priority labour market issues, related to five specific sub-sectors: Advanced Manufacturing; Aviation Training; In-Service Support/Maintenance, Repair & Overhaul (ISS/MRO); Research & Development; and Space & Remote Sensing.

Program Phase 1, Sector Engagement, was conducted by AIAC Pacific between September 19 and November 18, 2016. The sector engagement process (detailed below) involved engagement sessions, individual meetings and telephone interviews with aerospace industry leaders, human resources professionals, educators and representatives of organized labour. The goals of the sector engagement process were to gather as much information as possible regarding aerospace labour market issues within BC, including identifying current or anticipated imbalances between supply (workers) and demand (jobs), and a lack of appropriate skills and experience that may impede the development and growth of the sector. An additional goal of the engagement process was to recruit industry leaders for a sector governance committee to provide advice and guidance for the subsequent phases of the Program.

This report includes an overview of the Phase I Sector Engagement process, an inventory of occupations in demand, a summary of key findings and themes and an assessment of labour market challenges confronting the industry.

Sector Overview

The *Economic Impact Analysis and Capabilities Study of the BC Aerospace Industry*, produced for AIAC Pacific by KPMG and released in August 2015 (the KPMG study), portrayed the British Columbia aerospace industry as an established industry that makes a significant contribution to the provincial economy; and as an industry with key strengths and significant opportunities for growth, given its proximity to the Pacific Northwest aerospace cluster and the burgeoning Asia Pacific region.

The BC aerospace industry is comprised of approximately 190 small, medium and large aerospace and aerospace-related businesses. It employs over 8,000 British Columbians directly and up to another 12,000 indirectly. The industry generates estimated annual revenues of $2.4 billion and value added output (GDP) of $1.3 billion.

BC is home to the third largest aerospace sector in the country (by revenues, GDP and employment), after Quebec and Ontario. BC generates approximately 12% of Canada's total aerospace revenues, whereas Quebec and Ontario together account for 70 percent. In the context of Western Canada, the BC aerospace industry is comparable in size to the aerospace industries of Manitoba, Alberta and Saskatchewan combined.

BC is a national leader in the areas of In-Service Support/Maintenance, Repair & Overhaul (ISS/MRO) and Space. It is also home to a substantive manufacturing sector, with the majority of BC aerospace and related firms involved in or supporting aircraft component manufacturing. BC is also home to two of Canada's aerospace Original Equipment Manufacturers (OEMs) – Viking Air in the fixed-wing category and MDA in the space segment.[1]

At the outset of Phase 1 of the BC Aerospace Sector Labour Market Partnerships Program, individual industry sub-sectors were identified for the purposes of this project, and defined as follows:

BC Aerospace Sector				
Advanced Manufacturing	Aviation Training	In-Service Support/Maintenance, Repair & Overhaul (ISS/MRO)	Research & Development	Space & Remote Sensing

1. **Advanced Manufacturing** in aerospace involves the use of innovative ideas and technology to improve products or processes for manufacturing aircraft structures, components and systems.
2. **Aviation Training** encompasses fixed and rotary wing pilot training – in military, general commercial and niche markets such as mountain, bush, firefighting, and seaplanes – as well as aircraft maintenance and air traffic control training.
3. **In-Service Support/Maintenance, Repair & Overhaul (MRO/ISS)** consists of the ongoing service, upgrading and retrofit of in-service aircraft. The ISS service sector encompasses additional value-added activities such as project management, engineering services, integrated logistics support, modifications, airworthiness and lifecycle management.
4. **Research and Development** in aerospace involves developing new innovations and technologies, and bringing them to market – often through collaborative partnerships between academic institutions and industry. Aerospace research and development is considered critical to the long-term success of the industry.
5. **Space and Remote Sensing** sub-sector includes firms involved in the design, development and manufacturing of space vehicles, satellites and telecommunication systems; earth observation; space and system engineering services; and data and application development.

Problem Scope

The 2015 KPMG Study revealed that there is currently not a clear understanding of the talent requirements of the industry – current and anticipated – and that there is limited aerospace labour market data available for the BC market.

[1] Source: *Economic Impact Analysis and Capabilities Study of the BC Aerospace Industry*, Prepared for AIAC Pacific, KPMG LLP, August 2015

Furthermore, during four BC Aerospace Industry engagement sessions held between November 6 and December 4, 2015, the issue of education and talent development was a recurring theme. Both industry and academic participants concurred there was a disconnect between the needs of the industry, BC's educational capabilities/limitations, and getting students interested in and connected with aerospace industry opportunities.

Anecdotally, BC companies – particularly in the small to mid-sized establishment (SME) category – have expressed to AIAC Pacific that a) attraction and retention of qualified, skilled employees, b) knowledge transfer and succession planning, and c) limited training and development (both government enabled and on-the-job) are becoming increasingly problematic and obstacles to their ability to operate efficiently and successfully, and position themselves for growth.

CCAA Aviation and Aerospace Industry LMI Survey Report – January 2016

During the summer and fall of 2015, the Canadian Council for Aviation & Aerospace (CCAA) conducted a national Aviation and Aerospace Industry Labour Market Information (LMI) Survey, along with a series of "key informant" interviews. In total, 124 aerospace companies from across the country completed the survey, and another 29 key informants participated in telephone and in-person interviews. Of those, 20 BC companies (16% of the total) participated in the survey, and five BC aerospace representatives were among the key informants interviewed. The collected data and feedback was summarized in a report issued in January 2016. Findings and conclusions are presented at the national level and not reported at the individual provincial level.

Key findings include:

- 57% percent of the respondents expect their businesses will grow in the next year, and 83% expect they will grow over the next 5 years.
- 42% of respondents stated they face immediate and persistent recruitment challenges when hiring the skills they need. This is a significant result as it shows that a large minority of employers are not able to find the skills they need within a reasonable time frame.
- At the occupational level, recruitment challenges seem to be concentrated in managerial, technical and skilled trades occupations which require industry-specific skills. Respondents reported the most difficulty hiring: Aerospace Engineers or Engineers with sufficient industry and hands-on experience; CNC Machinists; avionics; Aircraft Maintenance Engineers with sufficient experience; supply chain knowledge; critical thinking skills; trouble shooting skills; leadership skills; and technical writing ability.
- Most companies reported they have a low attrition rate and that they do not experience chronic problems in retention. However, the companies do expect that retirements over the next year and the next five years may pose labour challenges, especially if new hires lack industry and company specific skills.
- Emerging technologies affect the skills and occupations required by about 34% of respondents. This is due both to the new software and programs used to operate old machinery, as well as new hardware used in advanced manufacturing such as seven-axis machining and electrical

automation. Employers tend to deal with these skills shortages primarily by providing internal and external training to their employees.

- A notable portion of respondents stated that they had to utilize overtime to be able to use the personnel with the right skills more effectively.
- Respondents are generally satisfied with the ability of post-secondary educational institutions to teach basic skills in the broad sense. However, they emphasize that post-secondary education does not adequately teach specialized and high-skill technologies. Hands-on learning in the workplace and additional in-house training are commonly used to complement post-secondary education to meet the aviation and aerospace industry's requirements for these specialized skills.

Based on these findings, the CCAA concludes in its report that a significant portion of the aerospace and aviation industry faces immediate and persistent recruitment challenges – especially in the technical and managerial occupations, and in finding industry-specific skills and experience in the available labour pool. Furthermore, this situation will likely be exacerbated by an increase in the number of expected retirements over the next few years, and by emerging technologies requiring new skills and specialized training.

Sector Engagement Process

As noted above, the objectives of the Phase 1 Sector Engagement Process were to engage with employers in the BC Aerospace sector to better understand labour market issues and the scope and extent of the challenges within each sub-sector, including identifying occupations within each sub-sector. An additional goal of the engagement process was to recruit industry leaders for a sector governance committee to provide advice and guidance for the subsequent phases of the Program.

The Phase 1 Sector Engagement process was comprised of two dedicated Engagement Sessions (Surrey and Kelowna), two consortium/committee discussions, three individual meetings, six telephone interviews, one presentation, and a general industry survey.

Engagement Sessions

Date	Location	# of Participants
October 5, 2016	Surrey, Surrey City Hall	7 industry, 2 academic, 2 government
October 6, 2016	Kelowna, UBC Okanagan	7 industry, 3 academic, 1 government

Note: A third Engagement Session was scheduled for Victoria, to be held on October 12, 2016, but was cancelled due to a lack of available industry participants.

Consortium/Committee Discussions

Date	Consortium/Committee	# of Participants	Sub-sector
October 13, 2016	BC Aviation Training Consortium	7 industry	Aviation Training
October 26, 2016	AIAC Pacific Space Committee	4 industry	Space & Remote Sensing

Individual Interviews

Date	Individual(s)	Company/Organization	Location	Sub-sector
October 31, 2016	**Tom Walters**, Managing Director; **Beth Arroyo Valencia**, Manager, Accounting and Finance	Saxon Aerospace	Langley	ISS/MRO, Other
November 7, 2016	**Robin Ambrose**, Director, People & Wellness	Viking Air	Sidney	Other
November 7, 2016	**Helen Salmon**, HR, Payroll & Benefits Administrator	VIH Aviation Group	Sidney	Other
November 9, 2016	**Brad Audette**, Director, Engine Programs	MTU Maintenance Canada	Richmond	ISS/MRO
November 15, 2016	**Michael Coughlin**, CEO	Pacific Sky Aviation	Sidney	Aviation Training
November 15, 2016	**Jeannie Blaney**, Union Representative	Unifor Local 114	Sidney	Other
November 16, 2016	**Kevin Hillier**, VP Flight Operations	Carson Air	Kelowna	Aviation Training, Other
November 16, 2016	**Dave McGrath**, Marketing, Business Development & Sales Director	VIH Aerospace	Sidney	ISS/MRO
November 17, 2016	**Lyle Hystad**, Owner	Redline Pro Manufacturing	Surrey	Advanced Manufacturing
November 18, 2016	**Ryan Evans**, President & PRM	Skye Avionics	Campbell River	ISS/MRO
November 24, 2016	**Guy Borowski,** General Manager North American Operations	Heli-One	Delta	ISS/MRO

Other

Date	Person/Position	Activity	Location
November 17, 2016	**Brad Audette**, Director, Engine Programs, MTU Maintenance Canada	Presentation: "Aligning Industry Needs with Talent"	Labour Market Strategy Day, Ottawa
November 17, 2016	**Gord Turner,** Associate Dean, Aerospace Programs, BCIT	Presentation: "Training Challenges for the Next Generation of Aviation Workers"	Labour Market Strategy Day, Ottawa

The Engagement Process included preparing an Interim Engagement Report which was circulated for comment to all who participated in the two Engagement Sessions and the Aviation Training Consortium discussion, and submitted to the Province on October 25, 2016, in accordance with the Agreement.

Through the two engagement sessions, two consortium/committee meetings, and individual interviews, 36 industry representatives, six academic representatives, one union representative and three government representatives were consulted. The survey was completed by another 22 industry and 1 academic representative. In total, the Engagement Process involved 65 separate individuals representing industry, academia, government agencies and organized labour. (Four industry reps participated in both an engagement session and the survey, but are only counted once in the total.) The two Engagement Sessions and one consortium meeting were also attended by a representative of the Ministry of Jobs, Tourism and Skills Training, who provided program guidance and support for the Sector Labour Market Partnerships program.

A complete listing of all consultation participants is included as Appendix C. A complete list of all occupations identified is included as Appendix H.

Governance Committee

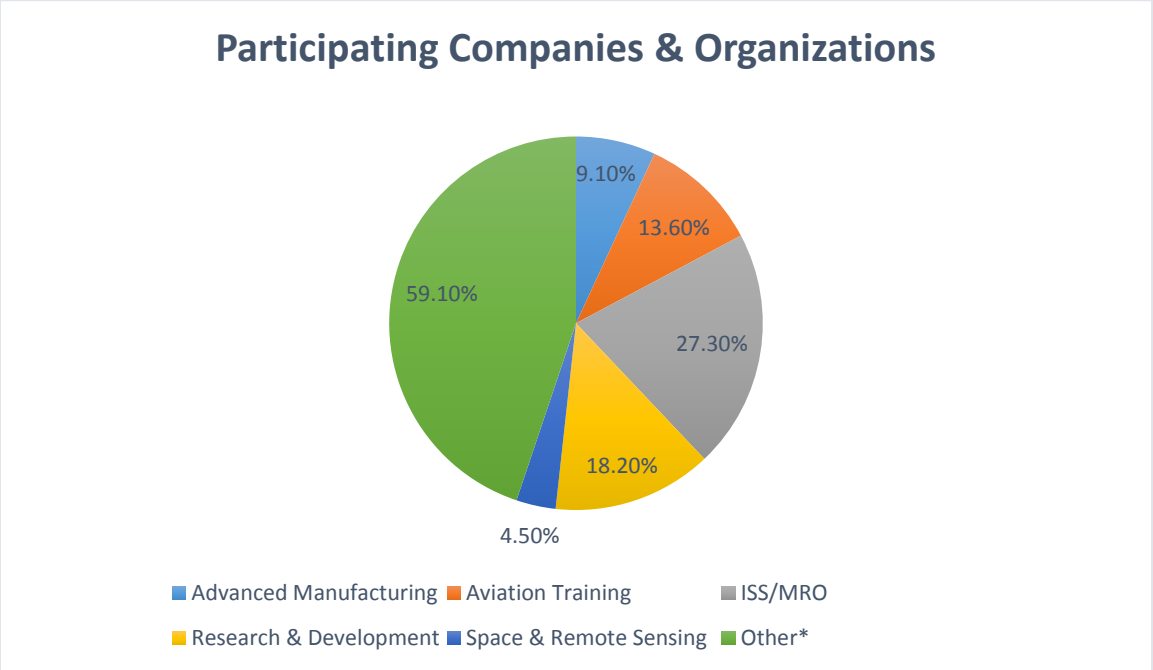
A Governance Committee, with representation from all five sub-sectors as well as representation from the key regional aerospace hubs across British Columbia (Lower Mainland/Greater Vancouver, the Fraser Valley, the Okanagan and Vancouver Island), has been established to support AIAC Pacific by providing advice to the BC Aerospace Sector Labour Market Partnerships Program, and to guide the subsequent phases of the project.

Sub-sector	Name, Position, Company/Organization	Location
Aviation Training	**Ian Kennedy**, Chief Operating Officer, Montair Aviation	Pitt Meadows
	Cathy Press, Chief Executive Officer, Chinook Helicopters	Abbotsford
Advanced Manufacturing	**Amandeep Kaler,** General Manager, Avcorp Industries	Delta
ISS/MRO	**Grant Stevens**, Director of Human Resources, KF Aerospace	Kelowna
	Brad Audette, Director of Engine Programs, MTU Maintenance Canada	Richmond
	Guy Borowski, General Manager, North American Operations, Heli-One	Delta
Research & Development	**Dwayne Lucas**, Regional Director, Consortium for Aerospace Research & Innovation in Canada (CARIC)	Kelowna
Space & Remote Sensing	**Russ Baker**, Director of Strategic Development, Urthecast	Vancouver
Other	**Robin Ambrose**, Director of People & Wellness, Viking Air	Sidney
	Rod Hayward, Assistant Professor of Aviation Management, University of the Fraser Valley	Abbotsford
	Leslie Hogan, Project Manager, Canadian Council for Aviation & Aerospace	Ottawa
	Rieghardt van Enter, Director - Industry Relations, Industry Training Authority of BC	Richmond
	Tom Walters, Managing Director, Saxon Aerospace	Langley
	Andrew Wynn-Williams, Divisional Vice President, BC, Canadian Manufacturers & Exporters	Vancouver

Survey Summary

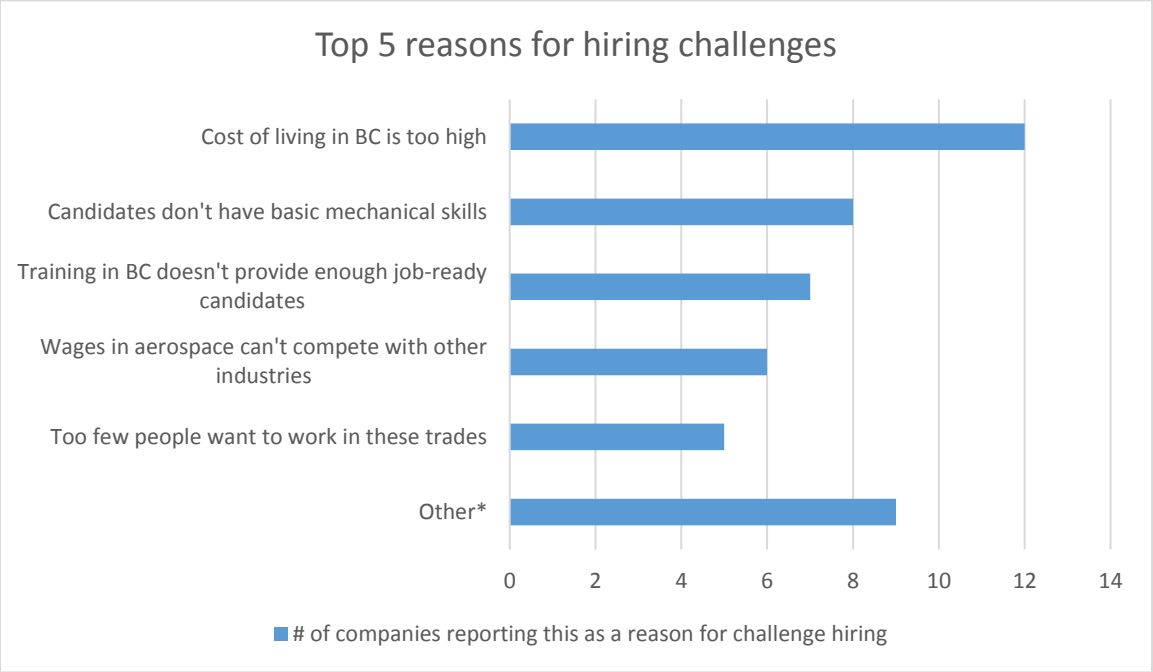
A Labour Market Partnerships survey open to all BC Aerospace companies and organizations was conducted between November 1-18, 2016. The survey was intended as an alternative for companies and organizations unable to participate in an Engagement Session, and as a way of formally collecting data from session participants. The questionnaire was developed based on themes and topics raised during the engagement sessions, committee/consortium meetings and initial individual interviews. In total, 22 BC aerospace companies and organizations participated in the survey. Results are summarized below.

Because the survey was supplementary to the engagement sessions and individual interviews, the percentages shown below may not be reflective of opinions expressed during the entire industry engagement exercise. However, AIAC Pacific believes that the perspectives gained during the engagement sessions and individual interviews are well aligned with the opinions expressed by survey participants.

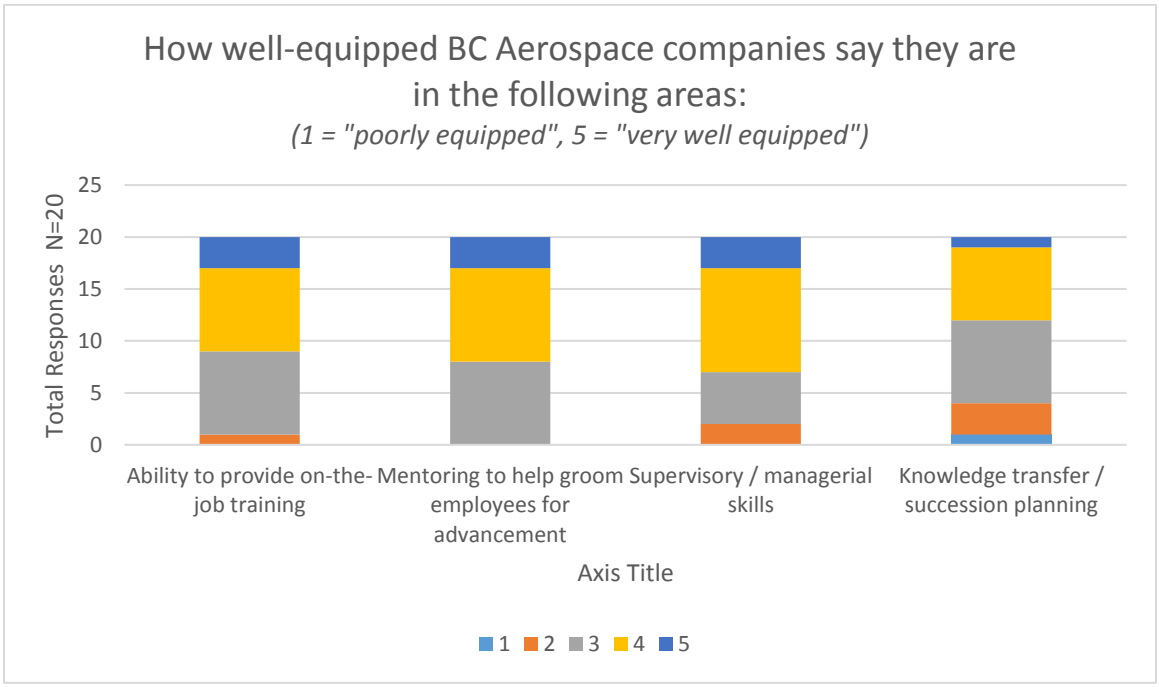


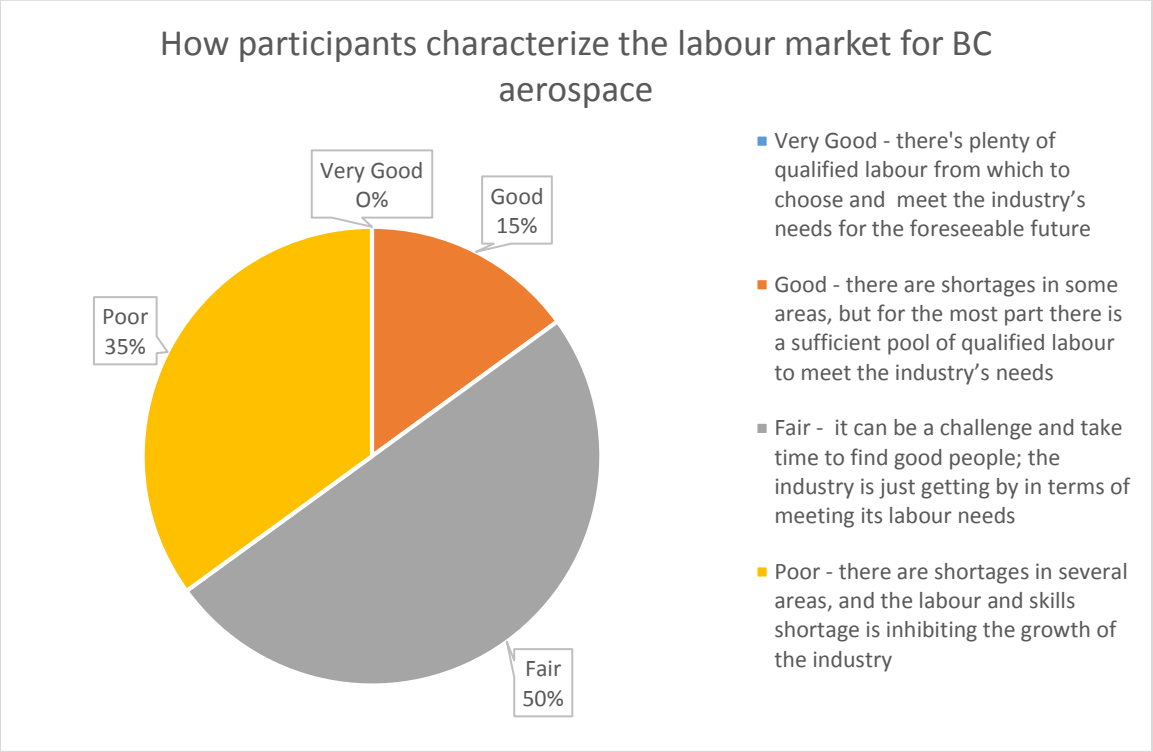
*Included as "Other" are avionics, electronics, software, MRO equipment manufacturing, drafting, consulting, flight operations, computer aided engineering, aircraft interior manufacturing, special processes.

* occupations reported as “Other” include ITB/military offset experts, business development personnel, qualified heat treat personnel, technical sewing machine operators, and truck drivers capable of obtaining security clearance.



* Reasons given as "Other" include: Lack of candidates with space experience in Western Canada; skill shortage exists not only in Canada, but around the world; lack of industry support for work experience cadet programs; boom-bust cycle drives people from industry; lack of awareness of aerospace positions; juniors don't feel there are opportunities here, senior people want semi-retirement positions; English language proficiency.





Key Findings and Themes

Throughout the Engagement Process (including the survey), a number and variety of problems, issues and obstacles were identified by both SME's and larger companies relating to finding and retaining qualified and productive employees. The following is a summary of key findings and recurring themes (in no specific order).

Current education/training does not provide "job-ready" employees

Graduates of programs such as Aircraft Maintenance Engineering at BCIT and Okanagan College are generally viewed as competent, but further specific "on the job" training is often required before they are considered productive. (The length of time it takes a new-hire to become fully productive is said to be roughly two years.)

The issue of students/trainees not being job-ready for job specific tasks is a particular challenge for SMEs that do not have the financial capability and mechanisms to support on-the-job training. There is a view among organized labour that the provincial government, through the Industry Training Authority, needs to provide more support for a broader selection of aerospace related occupations

(e.g. painters, sheet metal workers) in order to enhance the competitiveness of the industry and provide young workers with transferable skills.

Some companies – especially those hiring for highly specialized roles or those for which no training is offered through education institutions (e.g. assemblers) – have found it more practical to hire untrained "raw" workers and train them themselves, thereby "short-circuiting" the process and reducing the time it takes to fill those roles.

The skills-in-demand and skill shortages identified in Phase 1 represent examples only. It is expected that more in depth research to be performed in Phase 2 will provide a more comprehensive and complete list, and specify the severity of each shortage.

University aerospace engineering and space programs not offered in Western Canada

Options for students to obtain a degree in aerospace (or aeronautical) engineering in Canada are limited to a handful of universities in Central Canada, namely: Carleton University (Ottawa); École Polytechnique de Montréal; École de Technologie Supérieure (Montreal); Royal Military College of Canada (Kingston); and Ryerson University (Toronto). The BC aerospace industry finds it difficult to compete with the aerospace sectors in Ontario and Quebec for aerospace engineering graduates, due to both family and cost-of-living issues.

Similarly, British Columbia space sector companies are challenged to find local employees with in-demand skill-sets such as Imagery analysis and recognition, synthetic aperture radar, data analytics, systems and software engineering, and technical writing and communications. BC aerospace firms are regularly forced to search offshore for employees trained in these areas.

Integrated work-learning opportunities not being fully utilized

There are mixed views in the industry concerning student internships, work terms or university co-op programs, as they related to aerospace. Some companies have had good experiences with work-learning programs, finding the students productive and the programs to be good opportunities to identify and assess potential future employees. Others deemed work-learning programs to be too limited in availability or too short for companies to fully engage and assess the students. In general, student internships, co-ops and other integrated work-learning opportunities did not appear to be well known, well-understood or well-utilized by industry.

Cost of living and other geographic issues

As aerospace is a global and largely mobile industry, cost of living and geographic isolation in some parts of BC presents a challenge to the BC industry in attracting and retaining qualified employees. The high cost of living in the Lower Mainland (which, more recently has crept into the Fraser Valley, Victoria and Kelowna regions) can be a significant obstacle to recruiting talent from other parts of Canada and the US where housing and living costs are much lower. In addition, smaller job markets like the central Okanagan and Vancouver Island find it difficult to convince skilled workers to relocate due to concerns about jobs not working out, lay-offs, lack of alternative opportunities or a lack of spousal employment opportunities. In addition, Vancouver Island companies specifically reported a

challenge in recruiting for executive level talent due to a less favourable Canadian tax regime (compared to the US) and the inability to compete with larger markets (e.g. Vancouver, Calgary) where greater opportunities and higher salaries exist.

Absence of supervisory and managerial "soft skills", particularly among SMEs

There has been a tendency among aerospace companies, particularly in smaller businesses, to promote their top performing engineers and technicians into supervisory and management positions, without any managerial training or experience. Because top engineers and technicians don't always have the skill set required to be effective managers, results are often poor and the consequences dire, especially for companies trying to maximize productivity and manage growth. Larger companies, who have "learned the hard way", have for the most part set up systems and processes to reduce risks inherent in advancement. But this remains a particular problem for SMEs who don't typically have mechanisms or resources for mentoring or providing managerial and leadership training – or for whom tailored training does not fit into their business cycle. Furthermore, due to the highly technical and regulated nature of aerospace maintenance work, educational programs overlook "soft skills" to ensure workers have the skills required to meet safety standards and other regulatory requirements.

"Baby boom exodus", knowledge transfer and succession

Not unlike other industries whose workforces are comprised of large numbers of baby-boomers poised to retire, some BC aerospace SMEs recognize they have done a poor job of refreshing their workforce and transferring institutional knowledge to the next generation of employees. This problem is exacerbated by the challenges aerospace faces generally of recruiting qualified and quick-study employees.

"Boom and bust" nature of aerospace and the western Canadian economy

Aerospace – particularly in the ISS-MRO sub-sector – is a cyclical industry, with demands on the supply chain driven by economic conditions and global competition. Furthermore, the BC industry is vulnerable – both for demand and supply – on the health of the western resource economy. When the western resource economy is strong, demand for aerospace services are strong and recruitment/retention is a challenge. Conversely, when the western resource economy is soft, labour is in greater supply but demand for products and services is low. And, when demand for labour is low, the industry risks losing trained workers to other industries. This dichotomy and fluctuating labour/skills demand contributes to a reputation of instability and lessens the industry's attractiveness to potential employees.

Industry perceptions can limit applicants or lead to employee disillusionment

Perception is not necessarily reality when it comes to aerospace's popular image of being a glamorous or "sexy" industry. Many jobs – particularly in MRO – are "blue collar" in nature, and it can take several years to graduate from the shop floor or begin earning wages that are competitive with other industries. Comparatively low wages during the initial stages of employment make

employees particularly vulnerable to "poaching" by other industries. This more realistic perception of MRO work is beginning to manifest itself in fewer applicants – or the wrong kind of applicants – for Aircraft Maintenance Engineer (AME) training seats. Where AME training programs once had waiting lists, today it is not uncommon for them to be only partially full. An industry that historically has been able to "pick and choose" is increasingly being forced to take "whoever is available."

On the contrary, other roles such as machining, are plagued by a lingering image of being dirty, blue collar jobs – when, in fact, today's CNC machine shops are highly technical and sophisticated operations, requiring specialized skills to competently operate expensive, sophisticated machinery.

Broadly stated, the aerospace industry lacks a clear understanding of its value proposition, the image it needs to project, and where and how it needs to market itself in order to attract the right people and retain them to reduce turn-over.

Attracting employees with the "right" aptitudes for aerospace roles

A recurring theme throughout the province, and with SMEs, was the challenge of attracting the "right kinds of people" into the aerospace industry – specifically individuals with mechanical and analytical/problem-solving aptitudes, and computer skills. Employers concur that mechanically inclined individuals tend not to view aerospace as a viable career path, and look instead to high-paying resource sector jobs or electrical trades as preferable options. This is not a criticism of the training institutions, but rather a problem associated with perceptions of the aerospace industry, competition with other higher-paying sectors and an overall lack of individuals possessing basic mechanical or problem-solving skills. Conversely, those who are mechanically inclined may not possess the best computer skills, which can create challenges as paper manuals are disappearing, analysis is aided by spreadsheets and so much workplace communication is performed electronically.

Finally, according to the survey results, the number one occupation BC aerospace companies are challenged to hire are those with sales, management and business development experience specific to the aerospace industry.

Challenges attracting women to occupations in aerospace

Two sectors – space and manufacturing – noted that few women tend to pursue occupations and careers in aerospace, although many roles are ideally suited to female employees. One company, for example, noted that only five percent of their shop floor positions are occupied by women, even though the roles require precision and do not require heavy lifting. Similarly, BC space companies noted that data analytics and systems/software engineering continue to be male-dominated fields and that few of their in-demand positions attract female applicants.

Finding and retaining qualified pilots for aerospace and training roles

Pilots required for aerospace roles can be difficult to recruit, often due to highly specialized equipment and requirements; and difficult to retain due to competition from airlines. For example, one pilot training company requires experienced Twin Otter pilots who are inclined to be more attracted to jobs in other markets or other countries. Another reports a serious challenge in keeping

young pilots from taking jobs with commercial airlines – some of whom will even take a pay-cut if it means an opportunity to fly larger aircraft.

The aviation training sector (fixed wing and rotary) reports significant challenges due to a shortage of flight instructors and pilots with management/project management/business skills, as well as to losing pilots and trainers to "higher" positions (often located out-of-province). With British Columbia's geographic and economic links to the Asia Pacific, BC's Aviation Training sub-sector sees a massive opportunity to train overseas students (especially from China), but fears it is not equipped to respond to the opportunity – due in no small part to recruitment and retention challenges – and that it will lose out to the aviation training sectors in other Canadian provinces.

Challenges and costs associated with hiring foreign workers

The highly technical and specialized nature of aerospace – or the fast rate of growth in certain sectors – means that, in some cases, a locally trained Canadian resident is not available to fill a job opening. Canadian immigration laws and procedures, however, can be confusing, time-consuming and costly when hiring an experienced foreign worker. This is a particular problem for the aviation training and space sectors, where rapid growth combined with other retention challenges give companies little choice but to seek experienced employees from other countries. Furthermore, younger workers who are able to get training and gain experience in Canada may not be able to stay in Canada and return to their home country taking their training and experience with them.

This issue is also prominent with companies that are subject to cyclical demand and try to address cyclical labour needs with the help of temporary foreign workers.

Conclusions and Next Steps

The Phase 1 LMP Sector Engagement Process revealed a number and variety of labour market issues confronting the BC Aerospace industry. The issues raised demonstrate a requirement for additional information and analysis of aerospace sector labour market issues such as occupations in demand; education and training; industry perceptions; employee attraction, retention and advancement; and cost-of-living and other geographic challenges. Additional information is also required regarding the size and composition of the aerospace workforce, labour market forecasts and economic trends affecting the sector.

The Phase 2 Labour Market Information phase will provide for a deeper understanding of labour market issues challenging the BC aerospace industry, specify the skills-in-demand and quantify the severity of the skills shortages, and position the sector to engage in strategy development to address some of the critical labour market issues.

The Governance Committee recruited throughout the course of the Phase 1 Sector Engagement Process will play a key role in advising AIAC Pacific and guiding the research and analysis to be conducted in Phase 2, as well as subsequent phases covering strategy development, implementation and analysis.

APPENDICES

Appendix A: Engagement Plan

Appendix B: Engagement Session Invitation

Appendix C: Engagement Session Participants

Appendix D: Engagement Session Slides

Appendix E: Invitation to participate in survey

Appendix F: Survey

Appendix G: Sub-sectors, by NAICS classifications

Appendix H: Occupations in demand, by NOCS codes

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Appendix A: Engagement Plan

British Columbia Aerospace Industry
Labour Market Partnership
Phase 1: Aerospace Industry Engagement
Engagement Plan and Materials

September 16, 2016

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Purpose

The purpose of the Project is to bring together organizations within British Columbia's Aerospace Sector to achieve clear consensus and direction on priority labour market issues, related to ISS/MRO, advanced manufacturing, aviation training, space and remote sensing, and research development. The engagement process (Phase 1) will identify key issues including the quality and type of skill sets needed for current and future labour market needs.

Engagement Plan

- Assemble Industry Advisory Group (six to eight industry representatives) to advise on development of engagement materials and structuring of workshops (week of September 6-9)
- Communicate:
    - intent of Sector LMP Initiative to BC Aerospace Industry, provide advance notice of upcoming workshops (week of September 12-16);
    - invitations to participate in engagement workshop, specifying dates, locations and expectation (week of September 19-23).
- Conduct one-on-one interviews with Advisory Group members and other key individuals (up to 10), ensuring representation of all five industry subsectors (between September 19-30).
- Conduct three facilitated two-hour industry engagement workshops, one each in Greater Vancouver, Vancouver Island and Kelowna, likely in conjunction with educational facilities (e.g., BCIT Aerospace Campus, Camosun College and UBC Okanagan, respectively), between September 28 and October 12.
- For those unable to participate in a workshop, conduct a follow-up survey, open to all BC aerospace industry participants (between October 13-27).

Potential Workshop Agenda

- Welcome and Introductions
- JTST speaker
- Research findings to date
- Break-out group discussions
- Report out and summary

- Lunch and networking

Potential discussion topics

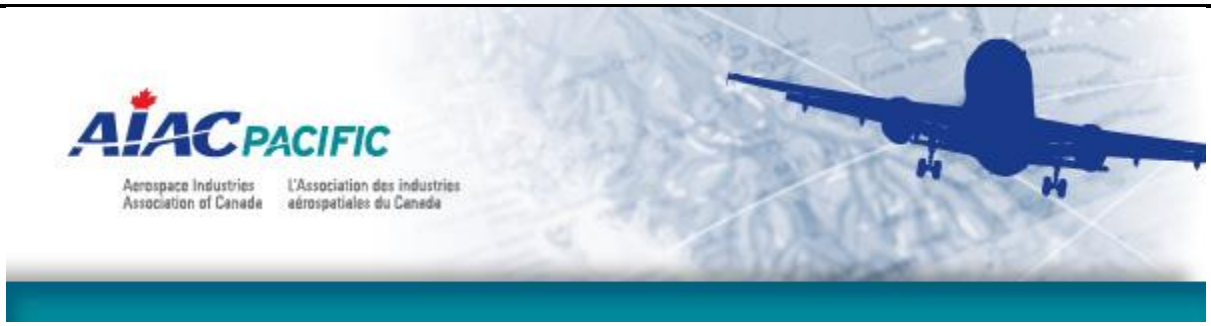
- What labour skill shortages does your company anticipate:
  - over the next 12-18 months?
  - over the next 2 – 4 years?
- What skills are currently available in BC, and what skills are lacking?
- What are the reasons behind the skill shortages?
- How severe is the skills shortage as it relates to the BC aerospace industry?
- What are the risks to the industry of a skills shortage?
- Are BC colleges and universities providing education and training to meet aerospace industry skill requirements:
  - If Yes, what programs are helping to meet the skills requirement?
- Are colleges and universities elsewhere in Canada providing education and training to meet aerospace industry skill requirements:
  - If yes, where and which programs?

Survey/questionnaire design

Survey will be designed to gain the perspectives of:

- Large employers (more than 500 employees)
- Mid-sized employers (between 100 and 500 employees)
- Small employers (fewer than 100 employees)

Appendix B: Engagement Session Invitation



AIAC Pacific seeks input on current and future aerospace labour and skills demands

Provide your input at one of three upcoming workshops

AIAC Pacific encourages you to attend one of our upcoming labour market workshops and give us your thoughts on the challenges you're experiencing today – or expect to encounter in the future – in finding the right people to fill your skills and labour needs, and help fuel your future growth. Representatives of academic institutions and government agencies are also encouraged to attend.

Please register to attend a two-hour workshop in your area:

- Wednesday, October 5th – Surrey, Surrey City Hall – 10 am to 12 noon (optional networking lunch from noon to 1 pm)
- Thursday, October 6th – Kelowna, UBC Okanagan – 9:30 am to 12:30 pm (optional networking lunch from 11:30 am – 12:30 pm)
- Wednesday, October 12th – Victoria, Camosun College, Lansdowne Campus – 10 am to 12 noon (optional networking lunch from noon to 1 pm)

To register, click here.

Room locations and parking information will be provided to all registrants.

The Economic Impact Analysis and Capabilities Study of the BC Aerospace Industry, released in August 2015, revealed that there is currently not a clear understanding of the talent requirements of the industry, and that there is limited aerospace labour market data available. We all have a strong interest in closing the knowledge gap and responding to the labour and skills training needs of the industry.

The purpose of this project is to bring together organizations within British Columbia's Aerospace Sector to achieve clear consensus and direction on priority labour market issues, related to ISS/MRO, advanced manufacturing, aviation training, space and remote sensing, and research and development. The engagement process will identify key issues including the quality and type of skill sets needed for current and future labour market needs, as well as create a leadership and governance structure for subsequent Sector Labour Market Partnership Program phases.

This project is made possible through funding provided through the Canada-British Columbia Labour Market Development Agreement, Sector Labour Market Partnership Programs. If you have any questions or comments at this stage, please click here for more information, or contact either Mike or Taylor at AIAC Pacific.

Sincerely,

Mike Mueller
Vice President, Operations & Communications, AIAC Pacific

Taylor Briggs
Vice President, Government Relations & Policy, AIAC Pacific

Appendix C: Engagement Session/Committee Meeting Participants

Engagement Workshop #1 – October 5, 2016 – Surrey (Surrey City Hall):

Company/Organization	Name	Title	Industry Sub-sector
Industry			
Airborne Engines Ltd.	Tony Sonnendrucker	PRM & QA Manager	ISS/MRO
Anotek Anodizing	Andrew Huige	President	Manufacturing – Special Processes
Cascade Aerospace	Melinda Luce	HR Advisor	ISS/MRO
Marshall Aerospace & Defence Group	Coral Forslund	HR Manager	ISS/MRO
Mint Turbines	Colin Kilmaster	Director, Engine Sales	ISS/MRO
Pyrotek Aerospace	Ted Croft	Partner	Manufacturing - Metallic Structure Processing
R.J. McGregor & Associates	Maria Schwarz	Sr VP & Associate	Consulting, Coaching
Academic			
BCIT	John Dymond	Program Head, International Business Management	
University of the Fraser Valley	Rod Hayward	Assistant Professor	
Government			
City of Surrey	Khushboo Wanchu	Economic Investment Strategist	
Industry Training Authority of BC	Tracey MacLennan	Manager, Industrial Relations & Engagement	

Engagement Workshop #2 – October 6, 2016 – Kelowna (UBC Okanagan):

Company/Organization	Name	Title	Industry Sub-sector
Industry			
Access Precision Machining Ltd.	Neil Horwood	Business Development	Manufacturing (Machining)
Access Precision Machining Ltd.	Mike Melin	General Manager	Manufacturing (Machining)
Contract Aero Structures Ltd.	Mike Arcand	President	Employment Agency
Contract Aero Structures Ltd.	Victor Raposo	Operations Manager	Employment Agency
KF Aerospace, ITA Aerospace SAG	Grant Stevens	Director, Human Resources; SAG Chair	ISS/MRO
Lucas Aero Strategies/CARIC	Dwayne Lucas	Consultant/Regional Director	R&D
SKYTRAC Systems Ltd.	Mike Ball	Engineering Manager	Communications, Certification and Analysis Services
Academic			
Mitacs / UBC	Jennifer Tedman-Jones	Director, Business Development	R&D
UBCO	Derek Gratz	Associate Director	R&D
UBCO Aero Club	Blago Hristovski	President	Engineering Student
Government			
Economic Development Commission, RDCO	Corie Griffiths	Director	

AIAC Pacific – Aviation Training Consortium – October 13, 2016 – Richmond (BCIT Aerospace Campus):

Company/Organization	Name	Title	Industry Sub-sector
Industry			
Canadian General Aviation Association	Annie Wu	General Secretary	Aviation Training
Chinook Helicopters	Cathy Press	CEO and CFI	Aviation Training
Iris Dynamics	Patrick McFadden	CTO	Aviation Training
Montair Aviation	Ian Kennedy	COO	Aviation Training
Platinum Aerospace International	Brian Pudsey	Director of Business Development	Aviation Training
Prince George Airport Authority	Allan Ridgway	Director, Cargo Business Development	Aviation Training
Racerocks 3D	Scott Dewis	CEO and Founder	Aviation Training

AIAC Pacific – Space Committee – October 26, 2016 – Conference Call:

Company/Organization	Name	Title	Industry sub-sector
Industry			
3V Geomatics	Adrian McCardle	President	Space & Remote Sensing
MDA	Doug Rae	Vice President, Global Expansion	Space & Remote Sensing
Urthecast	Russ Baker	Director, Strategic Initiatives	Space & Remote Sensing
Urthecast	Rohaib Garstin	Senior HR Manager	Space & Remote Sensing

Appendix D: Engagement Session Slides

Sector LabourMarket Partnerships

Canada-British Columbia Labour Market Development Agreement

Industry Engagement Session #1

AGENDA

10:00 –10:15Introductions
10:15 –10:20Sector Labour Market Partnerships overview
10:20 –10:30Facilitator consultation overview
10:30 –11:15Breakout discussions
11:15 –11:45Group discussion
11:45 –11:55Governance Board and Next Steps
11:55 –12:00Wrap -up

Program Overview - Structure

Five distinct phases make up the program

- The Sector LMP Program provides end-to-end support for sectors to address broader sector and regional labour market issues within British Columbia's diverse economy.
- Through a phased approach, sectors can identify workforce challenges, then develop and implement strategies to address those challenges.

Economic Impact Analysis and Capabilities Study of the BC Aerospace Industry

KPMG, August 2015

- currently limited data available regarding the talent requirements for the aerospace industry in BC and the degree to which these requirements are being met

Canadian Council for Aviation & Aerospace Labour Market Information Project 2015

- There is no nationally coherent Labour Market Information available to ensure the industry has enough workers with the right skills to allow for the projected growth
- Other LMI studies focus on GDP and not possible skills shortages and training gaps.

Sector Labour Market Partnerships Program

BC Aerospace - Phase 1

Purpose:

- Bring together organizations within BC's Aerospace sector to achieve clear consensus and direction on priority labour market issues
- Phase 1 –engagement process –identify key issues including the quality and type of skill sets needed for current and future labour market needs

AIAC PACIFIC
Aerospace Industries Association of Canada | L'Association des industries aérospatiales du Canada

Sector Labour Market Partnerships Program
BC Aerospace - Phase 1

Process:

- Break-out discussions –grouped by sector
- Full group discussions –review group feedback, identify priority issues

Instructions
Breakout sessions –45 minutes

1. Breakout groups are comprised of industry subsectors
2. Identify both the 'what' and the 'why' of the issue
3. Summarize each issue on a separate Post-it Note
4. Notes are colour-coded to identify industry subsector
5. Focus on identifying issues, not solutions

Instructions
Full group session –30 minutes

1. To start, similar issues will be grouped into themes
2. Themes will be discussed to develop greater understanding
3. Notes will be taken to capture key points

Sector LabourMarket Partnerships

Canada-British Columbia Labour Market Development Agreement

Industry Engagement Session #1

Governance Board for Phases 2 –5

- Sectors
- Regions
- Interest

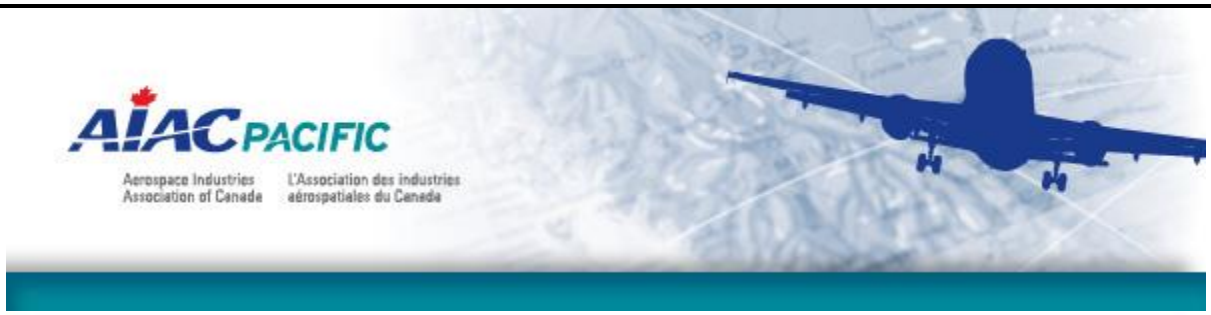
Next steps

- Phase 1 Report
- Phase 2

Networking Lunch

Thank You!

Appendix E: Invitation to participate in survey



FOR ACTION

Help AIAC Pacific understand BC's aerospace labour and skills needs

Please complete a short (10 minute) survey by November 15th.

AIAC Pacific is conducting a labour market study and needs your input.

During the past month, AIAC Pacific – working in partnership with the provincial government – has conducted a number of consultation sessions with various groups in different regions to gather information about the BC Aerospace Industry's labour and skills needs – including the occupations you're struggling to hire, and the reasons why. If you were able to participate in one of these consultation sessions – THANK YOU! Your participation and feedback is greatly appreciated. If you weren't able to make it to one of these sessions, you can still provide your feedback by completing a short survey.

It's important that we hear from as many of you as possible, and from companies large and small in different sectors and in different parts of the province. Please help us by completing this short (10 minute) survey. Even if you did participate in one of the consultation sessions, please complete the survey so we have a record of your specific thoughts. (One response per company is sufficient.)

To access the survey, click here. We will be accepting responses until **Tuesday, November 15th.**

This project is made possible with funding provided through the Canada-British Columbia Labour Market Development Agreement, Sector Labour Market Partnership Programs. The purpose of this project is to work with organizations within British Columbia's Aerospace Sector to achieve clear consensus and direction on priority labour market issues - related to ISS/MRO, advanced manufacturing, aviation training, space and remote sensing, and research and development. The engagement process will identify key issues including the quality and type of skill sets needed for current and future labour market needs, as well as create a leadership and governance structure for subsequent Sector LMP Program phases.

If you have any questions, please feel free to contact either of us.

Sincerely,

Mike Mueller
Vice President, Operations & Communications, AIAC Pacific
MMueller@aiac.ca (604) 655-3566

Taylor Briggs
Vice President, Government Relations & Policy, AIAC Pacific
TBriggs@aiac.ca (604) 652-3324

Appendix F: Survey

Survey Questions:

1. Company Name

2. Industry Sector:
   - □ Advanced Manufacturing
   - □ Aviation Training
   - □ ISS/MRO
   - □ Research & Development
   - □ Space & Remote Sensing
   - □ Other (please specify) _____

3. Location

4. Total Number of employees (in BC)

5. Types of Occupations in your workforce – just your top 5 (or fewer)

6. Which occupations does your company currently have issues trying to hire – or which do you anticipate having issues trying to hire in the next few years?

   - □ Aerospace engineers/Aircraft Maintenance Engineers (AMEs)/Structures AMEs
   - □ Avionics technicians (certified)
   - □ Machine trades – journeymen
   - □ CNC Machinists
   - □ Composite structure technicians
   - □ Sales staff and managers with aerospace experience
   - □ Information systems analysts/consultants/manager
   - □ Software engineers and designers
   - □ Turbine technicians
   - □ NDT – non-destructive testers and inspectors
   - □ Painters
   - □ Welders
   - □ Aviation instructors/trainers (fixed-wind and rotary)
   - □ Project Managers
   - □ Labourers who are mechanically inclined
   - □ General Aviation experience
   - □ Others (please specify) _____.

7. Why do you anticipate having issues trying to hire these occupations?

   - □ Aerospace/Aviation engineering programs not available in Western Canada
   - □ Training available in BC does not provide enough "job-ready" graduates
   - □ Competition with other industries for qualified candidates
   - □ Too few people want to work in these trades
   - □ People don't want to work in Aerospace
   - □ Wages in aerospace can't compete with other industries
   - □ Candidates do not have basic mechanical skills
   - □ Cost of living in BC is too high
   - □ Other reasons (please specify) _____.

8. How well equipped would you say your company is in the following areas:

   - □ Mentoring/on-the-job training?
   - □ Supervisory/managerial skills?
   - □ Knowledge transfer/succession planning?

9. Overall, how would you characterize the labour market for aerospace in BC:

   - □ Very good – there is plenty of qualified labour from which to choose and to meet the industry's needs for the foreseeable future
   - □ Good – there are shortages in some areas, but for the most part there is a sufficient pool of qualified labour to meet the aerospace industry's needs
   - □ Fair – it can be a challenge and can take time to find good people; the industry is just getting by in terms of meeting its labour needs
   - □ Poor – there are shortages in several areas, and the labour and skills shortage is inhibiting the growth of the industry

- end -

Appendix G: Sub-sectors, by NAICS Classification

Sub-sector	NAICS Code(s) & Category Description
In-Service Support/Maintenance, Repair & Overhaul (ISS/MRO)	488190 - Other Support Activities for Air Transportation 541330 - Engineering Services
Advanced Manufacturing	336410 - Aerospace Product and Parts Manufacturing 332710 - Machine Shops 332810 - Coating, engraving, cold and heat treating and allied activities
Aviation Training	481215 - Non-Scheduled Specialty Flying Services 611510 - Technical and trade school
Space & Remoting Sensing	336410 - Aerospace Product and Parts Manufacturing 541360 - Geophysical surveying and mapping services 541370 - Surveying and Mapping (except Geophysical) Services 541330 - Engineering services 334220 - Radio and television broadcasting and wireless communications equipment manufacturing
Research & Development	541710 - Research and development in the physical, engineering and life sciences

Appendix H: Occupations in demand, by NOCS codes

Occupation	NOCS Code(s)	
Aerospace engineers/Aircraft Maintenance Engineers (AMEs)/Structures AMEs	7315 Aircraft mechanics and aircraft inspectors 2232 Mechanical engineering technologists and technicians 2146 Aerospace engineers	ISS/MRO, Advanced Manufacturing
Assemblers (aircraft)	9521 Aircraft assemblers and aircraft assembly inspectors	Other (Manufacturing)
Aviation instructors/trainers (fixed-wind and rotary)	2271 Air pilots, flight engineers and flying instructors	Aviation Training
Avionics technicians (certified)	2244 Aircraft instrument, electrical and avionics mechanics, technicians and inspectors	ISS/MRO, Other (Manufacturing)
CNC Machinists	7231 Machinists and machining and tooling inspectors 9417 Machining tool operators	Advanced Manufacturing, Other (Manufacturing)
Composite structure technicians	2211 Chemical technologists and technicians 7315 Composite repair technician – aircraft	ISS/MRO, Advanced Manufacturing
Data analysts (space and remote sensing)	2172 Database analysts and data administrators 2147 Computer engineers (except software engineers and designers) 2255 Technical occupations in geomatics and meteorology	Space & Remote Sensing
Design/software technicians	2173 Software engineers and designers	All
General Aviation experience	n/a	All
Heat treat personnel	9411 Machine operators, mineral and metal processing 9415 Inspectors and testers, mineral and metal processing	Other (Manufacturing)
IT professionals	2171 Information systems analysts and consultants 0213 Computer and information systems managers	All
Labourers who are mechanically inclined	9619 Other labourers in processing, manufacturing and utilities	All
Machine trades – journeymen	7231 Machinists and machining and tooling inspectors	ISS/MRO, Advanced Manufacturing, Other (Manufacturing)
NDT – non-destructive testing	2261 Non-destructive testers and inspection technicians	ISS/MRO, Advanced Manufacturing, Other (Manufacturing)

Painters	9536 Industrial painters, coaters and metal finishing process operators	ISS/MRO, Other (Manufacturing)
Pilots	2271 Air pilots, flight engineers and flying instructors	Aviation Training
Project Managers	0211 Engineering managers 0213 Computer and information systems managers 0711 Construction managers	All
Sales staff and managers with aerospace experience	6221 Technical sales specialists - wholesale trade 0601 Corporate sales managers	ISS/MRO, Advanced Manufacturing, Aviation Training, Space & Remote Sensing
Turbines	7315 Aircraft mechanics and aircraft inspectors 9526 Mechanical assemblers and inspectors	ISS/MRO, Advanced Manufacturing, Other (Manufacturing)
Technical sewing machine operators	6345 Upholsterers	ISS/MRO, Other (Manufacturing)
Welders	7237 Welders and related machine operators	ISS/MRO, Other (Manufacturing)