



Education and Training  
Inspectorate

## ApprenticeshipsNI Provision in Bombardier Aerospace, Belfast

Report of an Inspection in  
June 2015

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## **1. Context**

Bombardier Aerospace, Belfast (Bombardier) is part of an international corporation involved in the engineering design and development of transportation equipment, with its headquarters in Montreal, Canada. It is one of the largest aerospace manufacturing facilities in the UK, employing approximately 6000 people, and is a centre of excellence for the design and manufacture of aircraft fuselages, engine nacelle systems, wings, flight control surfaces, and for manufacturing engineering processes such as advanced composites and computer-aided design/manufacture. It currently operates out of five sites in the greater Belfast area, one each in Dunmurry, Newtownards and Queen's Island, and two in Newtownabbey.

Bombardier is contracted by the Department for Employment and Learning (Department) to provide apprenticeship training through the ApprenticeshipsNI programme. It recruits approximately 40 apprentices annually, a minority of whom are recruited through the engineering skills for industry project which supports the unemployed from high deprivation areas of Belfast to access the apprenticeship programme, as part of the organisation's corporate social responsibility initiative.

At the time of the inspection, a total of 120 apprentices were registered on the level 3 ApprenticeshipsNI programme, and a further 20 apprentices were registered on the pilot higher level apprenticeship programme. While almost all (92%) of the apprentices were male, Bombardier is working hard to increase the number of female apprentices through its education liaison and Science, Technology, Engineering and Mathematics (STEM) ambassador programmes.

Over a four year period, all of the apprentices on the level 3 programme work towards achieving a National Vocational Qualification (NVQ) in aircraft fitting or in engineering design at level 3, along with a level 3 technical certificate in aeronautical engineering. They also complete a level 2 NVQ in performing engineering operations. Where necessary, the apprentices undertake essential skills qualifications in literacy, numeracy, and information communication technology (ICT) at level 2. The apprentices recruited through the engineering skills for industry project may be required to initially complete a level 2 technical certificate in engineering, if they do not meet the entry criteria for the level 3 technical certificate.

During the first year of the apprenticeship programme all of the apprentices attend Bombardier's off-the-job training centre for four days each week to receive practical skills training and to work towards achieving their level 2 NVQ. They also attend the Belfast Metropolitan College (College) one day each week to complete their appropriate technical certificate. During year two, the apprentices progress to work-based training and rotate across the company's production areas where they get a broad range of training experiences and undertake their respective level 3 NVQ in either aircraft fitting or engineering design. All of the apprentices continue to attend the College one day each week to undertake their relevant technical certificate. Those apprentices who are undertaking essential skills qualifications in literacy and numeracy either complete them at the Belfast Metropolitan College or at the North West Regional College. The essential skill of ICT is delivered in-house by Bombardier staff during the first year of the apprentices' programme.

The qualification profile of the apprentices on entry to the programme is high. Almost all of the current year one apprentices commenced their training with four or more GCSEs including English and mathematics, at grades A\* to C. The number of apprentices undertaking essential skills training in literacy and numeracy at level 2 is traditionally low and, during the inspection, only a small number of the apprentices were undertaking essential skills training in these disciplines. The majority of them, however, were undertaking training in the essential skill of ICT at level 2.

## 2. Overall Finding

Overall, the quality of training provided by Bombardier is very good.

Overall Effectiveness	Very Good
Achievements and Standards	Outstanding
Quality of Provision for Learning	Very Good
Leadership and Management	Very Good

### What does Bombardier need to do to bring about further improvement?

- To continue to develop and refine the processes used for self-evaluation and quality improvement planning, including the use of more evaluative language, the improved involvement of the key stakeholder in the processes, and to better align the processes with other quality systems used across the company.

## 3. Key Findings of the Inspection

### 3.1 Achievements and standards are outstanding.

The standard of the apprentices' technical knowledge is very good and often outstanding. Most of the apprentices have at least a sound understanding of mathematics, engineering and scientific principles, and of current manufacturing technology relating to the manufacturing of aerospace components within Bombardier. In particular, the apprentices are very aware of the features and benefits of modern composite materials, and they can apply effectively their knowledge and understanding of advanced engineering materials to their own working environment.

The standard of the apprentices' written assignments is very high; they are mostly very well presented, with good standards of spelling, punctuation and grammar. The apprentices are able to research and use a variety of information sources to solve problems and underpin responses in their assignments and project work. All of the work in their NVQ portfolios of evidence, both at levels 2 and 3, is also completed to a very high standard and the entries are very detailed; some of the year 2 apprentices use their record of jobs as a reference guide to help them remember procedures when performing certain operations. The assessment process is rigorous, with entries being signed off by the appropriate instructor.

Almost all of the apprentices are highly motivated and are progressing well in their practical training and assessment tasks within the Bombardier skills training centre. They work to very high standards in the completion of a range of engineering activities, which they carry out independently and with confidence. All of the off-the-job practical work is completed to the same high standards as will be expected by their supervisors when the apprentices progress to employment in the production workshops or other specialist engineering functions across the organisation.

In both their off-the-job training and in the workplace, the apprentices can follow complex instructions, interpret engineering drawings, and self-assess effectively the quality of their work. Most of them are developing highly specialised skills, are using and applying mathematics to solve complex problems, and are making extensive use of ICT in the completion of their tasks. They also use a wide range of hand tools to carry out precision engineering manufacturing operations on aircraft parts which are of a very high value.

The standard of work in the apprentices' ICT essential skills portfolios is very good. The apprentices complete an assessment task which is contextually relevant to their job roles and is set at an appropriate level. They use an appropriate range of industry standard software packages well to present a variety of information in different formats.

Over the past four years, the retention rate on the apprenticeship programme was outstanding at 92%. All of the apprentices who completed their programme achieved their full framework qualification; all those apprentices who completed their essential skills qualifications in literacy, numeracy and ICT also successfully achieved. The retention rate for the current group of apprentices is also outstanding at 98%.

### **3.2 The quality of the provision for learning is very good.**

The College's directed training for the technical certificate, and the in-house Bombardier training for the ICT essential skill, had finished at the time of the inspection and it was therefore not possible to directly observe formal sessions. A coherent, well-planned curriculum offer is in place which allows the apprentices to undertake a broad range of relevant engineering and mathematical units that enables them to develop their technical skills and understanding of engineering principles and manufacturing technology, with an appropriate focus on aerospace design and manufacture. Importantly, through the College's recent investment in modern equipment to design, manufacture and test carbon fibre composite components, the apprentices have good opportunities to investigate the properties and the manufacturing processes relating to advanced composite materials used in the aerospace industry. The appropriateness of the curriculum offer, together with the blended delivery of engineering manufacturing units with staff in the Bombardier training centre, ensures the range of learning experiences is both tailored to meet the needs of the company and of the apprentices. It also provides the apprentices, on completion of their apprenticeship programme, with the necessary knowledge, skills and competences required to progress to higher education and/or more advanced job roles within the company.

Increasingly, Information Learning Technology (ILT) is being used more effectively by the College to support and engage the apprentices in their learning and assessment; for example, through the College's virtual learning environment (VLE) which is well populated with lesson notes, additional reading material and links to external digital material. Staff also make use of the recording and tracking facility of the VLE to update and inform the apprentices of their achievements and progress and key Bombardier staff have recently been given online access to the apprentices' assessment records to inform the monthly monitoring and review process. While these communication links between the College, Bombardier staff, and the apprentices are positive developments, they need to be further embedded and exploited to allow for the more effective planning, monitoring and reporting of the apprentices' progress. This is particularly pertinent for a minority of the apprentices who experience difficulties in achieving all aspects of their qualification to the appropriate standard and/or who fail to meet agreed assessment deadlines. In these instances, they are supported well by the College staff and are provided with appropriate opportunities for additional learning support and to repeat their units, mostly with a successful outcome.

The practical training delivered by Bombardier for all of the first year apprentices in the training centre is of a very high standard. The apprentices are getting an excellent range of experiences and are developing very good skills. They are all very positive about their experiences on the apprenticeship programme in Bombardier and feel well supported by their supervisors. Through a rotation system, the apprentices complete a good range of jobs in bench fitting, sheet metal and aircraft fitting. As the practical tasks progress they increase in complexity and tolerance to challenge the apprentices at the various stages of their programme. All of the apprentices' work is marked and tracked using an overall monitoring sheet so the instructors know exactly how they are progressing. The instructors meet regularly and also hold regular team meetings with the apprentices, who are well informed about the process used to allocate their job roles at the end of year two. They are also well informed about health and safety issues and are well prepared for work-placements and for future working on the factory floor.

All of the second year apprentices are placed for three separate four month periods across the company's different sites to develop their experience, carrying out a range of production activities including working with sheet metal and composite materials, and using jigs to assemble aircraft fittings. They receive very good feedback from their workplace mentor on how they could improve the quality or speed of their work. They also complete records that form part of the audit trail of manufacture.

The NVQ assessment process is rigorous and well-monitored, but is currently paper-based; consideration could be given to the development or implementation of an electronic portfolio system to more effectively collate assessment evidence and track each apprentice's progress. The internal verification process is also robust. The assessment entries for the first year apprentices, while they are in the training centre, are individualised and they record well their skills and knowledge development. The assessments for the remaining apprentices, who are in the workplace, are matched well to their specific job roles across the company sites.

The quality of the essential skills provision is mostly good. The apprentices have good opportunities to transfer the essential skills to their professional and technical training and in the workplace. Their progress in completing the essential skills needs to be more systematically monitored, however, particularly for the small number of them completing literacy and numeracy. In addition, the arrangements for the initial assessment of the apprentices' mathematics skills at the start of the first year of their apprenticeship are not sufficiently robust. While appropriate learning support classes are provided to support those apprentices who have difficulty completing mathematics units, these are not timely enough and should be provided earlier to allow sufficient time for the apprentices to further develop an understanding of the key mathematical concepts required for their professional and technical units.

The quality of the pastoral care is outstanding. The apprentices interviewed were almost all positive about the overall quality of their training and the high levels of support they receive; they felt valued in the organisation. All of them stated that they are kept well informed about key issues arising across the organisation, and that they felt safe and knew who to talk to if they had any concerns. Links to the internal occupational health department provide the apprentices with access to a range of programmes including drugs and alcohol awareness, mental health issues, and smoking cessation classes. The apprentices also have access to an external support agency for guidance and support, if required. None of the apprentices were identified as having additional learning support needs during the inspection, but where additional support is needed, this is handled on an individual basis.

The quality of the provision for careers is very good, but is mostly informal. While the apprentices are well-informed about career progression pathways, including opportunities to gain promotion within the company to the highest levels, or to undertake relevant technical and management, specialist up-skilling, or other higher education qualifications, no structured provision for careers education, information, advice and guidance is in place, the information the apprentices receive is mostly from their instructors or workplace supervisors.

The apprentices' personal training plans are of a good quality and are underpinned by effective processes to monitor and review the apprentices' progress both during training and in the workplace. They are not currently being used well enough to capture the outcomes of the apprentices' initial assessments, however, to allow effective and timely learning support to be put in place for those apprentices who require it.

### **3.3 The quality of the leadership and management is very good.**

The apprenticeship programme is highly valued by management and staff across the company. The manager of learning and skills, with the support of the human resource officer and instructors, effectively manage and co-ordinate the programme. A very good training programme is in place which is matched well to the on-going business needs of the company, and provides the apprentices with high quality training experiences and access to a varied range of career progression pathways.

Robust quality assurance systems are in place within Bombardier to promote and monitor continuous improvement in the delivery of a high quality training programme within a safe working environment. The quality systems are implemented consistently across the business units and are used well to inform staff and apprentices of key issues arising across the organisation. However, while the ETI has confidence in the processes used for self-evaluation and quality improvement planning, they do not evaluate rigorously enough the quality of the provision within the College, do not make sufficient reference to the views of other key stakeholders such as the apprentices, and are not aligned well enough to the company's other key quality processes.

The instructors are well-qualified and experienced, and have good opportunities to undertake relevant continuous professional development and progress in their job roles within the company. In the College, a recently refreshed teaching team includes the appointment of two new full-time lecturers and one part-time lecturer with a broad range of expertise and experience of the aerospace industry. Importantly, this includes lecturers who have previously worked in Bombardier with current expertise in aerospace design and manufacturing processes.

The quality of the physical resources, accommodation, and tools and equipment within the Bombardier skills training centre are excellent. The apprentices have access to a high quality working environment including good quality classrooms, a well resourced ICT suite, a relaxation room, locker facilities, an occupational healthcare facility, and restaurant facilities. The College is also currently in the process of upgrading their specialist resources, including the further development of its composite manufacturing facility and the on-going development of its ILT facilities. Planning is underway to relocate the composite manufacturing facility with a modern scientific testing laboratory. While the apprentices have access to modern ICT equipment within the College's learning resource centre, a more specialist and dedicated ICT suite would enhance the quality of the apprentices' learning experiences.

Bombardier, as an international company and industry leader in the development of new technologies and products, has extensive links and partnerships with a range of engineering companies, universities and colleges, research and development organisations, innovation centres, and other key stakeholders. It has been a key participant in the engineering skills for industry project which aims to engage, encourage and support the unemployed and long-term unemployed in obtaining skills to assist them in competing for job opportunities, and it has an extensive outreach programme with schools, which involves staff and apprentices visiting schools and attending careers conventions as STEM ambassadors to highlight careers in Bombardier and in engineering. During August 2015, an aerospace summer camp is being delivered in collaboration with a number of key partners to highlight careers in engineering, for young people aged 16-24.

On the basis of the evidence available at the time of the inspection, while the arrangements for safeguarding vulnerable groups comply satisfactorily with the Safeguarding Vulnerable Groups (NI) Order 2007, the following areas need to be addressed:

- the recently appointed designated officer, and a member of senior staff, need to undertake safeguarding training, and the deputy designated person requires refresher training to be carried out, as soon as possible; and
- the parents/carers of those apprentices who are under 18 years old, should be informed about the safeguarding arrangements.

#### **4. Conclusion**

In Bombardier Aerospace, Belfast, the quality of training provided is very good. The company is meeting very effectively the educational and pastoral needs of the apprentices; and has demonstrated its capacity for sustained self-improvement.

#### **5. Inspection method and evidence base**

The inspection focused on:

- the achievements and standards;
- the effectiveness of the self-evaluation and quality improvement planning processes;
- the quality of provision for training and learning; and
- the quality of the leadership and management of the organisation.

The key questions and quality indicators which guide inspection and self-evaluation in these three aspects of training supplier organisations, which were applied to this inspection, are available in the ETI's publication *Improving Quality: Raising Standards Work-based Learning* <http://www.eti.gov.uk/index/improving-quality-raising-standards/improving-quality-raising-standards-igrs-work-based-learning.htm>



A team of four inspectors observed a total of five training sessions. Inspectors visited workplaces and apprentices were interviewed in focus groups. The inspectors also held discussions with the management team, training staff, tutors, and other key personnel involved in the delivery of the apprenticeship programme. In addition, inspectors examined samples of the apprentices' work, assignments, course resources, monitoring and tracking documentation and apprentices' personal training plans. The organisation's self-evaluation report and other relevant documentation were also scrutinised.

The inspection also focused on the arrangements for care, support and guidance and the safeguarding of vulnerable groups. The arrangements for the inspection included the opportunity for the apprentices to complete a confidential online questionnaire prior to the inspection.

Questionnaire	Number issued	Number returned	Percentage returned (%)	Number with comments
Learners	140	58	41%	16

The returns from the apprentices were mostly positive about their training programme with Bombardier, however, a minority of the apprentices raised concerns about the quality of the technical training provided in the College. In particular, they raised issues around the content and delivery, poor initial timetabling arrangements, the impact of staff transition arrangements at the beginning of their programme, and limited information about what was expected for assessment content.

## 6. Information about Bombardier Aerospace, Belfast

### Current registrations by programme

Programme	Number of apprentices	% of total registrations
ApprenticeshipsNI	140	100%

### Current registrations by professional and technical area

Professional and technical area	Number of apprentices	% of total registrations
Aeronautical Engineering (Level 3)	120	86% <sup>1</sup>

### Qualifications of current apprentices on entry to their programme

Programme	ApprenticeshipsNI (%)
(%) of learners with 4 or more GCSEs or equivalent at Grades A*-C including English and mathematics	90
(%) of learners with 4 or more GCSEs or equivalent at Grades A*-C	90
(%) of learners with GCSE English and mathematics or equivalent at Grades A*-C	100
(%) of learners with 4 or more GCSEs or equivalent at Grades A*-G	100
(%) of learners with no prior level 1 or level 2 qualifications	0

Note: All data was sourced from Bombardier at the time of the inspection.

<sup>1</sup> The remainder of the apprentices are undertaking a pilot higher level apprenticeship programme

## 7. Quantitative terms used by the ETI

In this report, proportions may be described as percentages, common fractions and in more general quantitative terms. Where more general terms are used, they should be interpreted as follows:

Almost/nearly all	-	more than 90%
Most	-	75%-90%
A majority	-	50%-74%
A significant minority	-	30%-49%
A minority	-	10%-29%
Very few/a small number	-	less than 10%

### Performance levels

The Education and Training Inspectorate (ETI) use the following performance levels in reports:

DESCRIPTOR
Outstanding
Very Good
Good
Satisfactory
Inadequate
Unsatisfactory

### Key Performance Indicators

Key Performance Indicators and Definitions	
Retention	The percentage of enrolments at week 4 of year one who completed their occupational training framework, measured over the full duration of their course.
Achievement	The percentage of trainees/apprentices who completed their occupational training framework and who fully achieved their framework qualification.
Progression	The percentage of successful completers who progressed to further/higher education/training or employment.

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