

# DEPARTMENT OF NATIONAL DEFENCE (DND) Assesses Airworthiness Training Requirements with ADVISOR Enterprise

## Overview

The DND Airworthiness (AW) Program mirrors Transport Canada and the Federal Aviation Administration's (FAA) Programs DND Airworthiness Authority is delegated by the Minister of National Defense (MND) to the Chief of Air Staff (CAF) and that position is ultimately responsible for

"BNH provided a comprehensive and timely report that met our requirements and expectations".

Lt Col. Dave Mason  
Chief of Staff Directorate Technical Airworthiness/  
Engineering Support  
Canadian Dept. of National Defence

the conduct of airworthiness activities as mandated by the Aeronautics Act. This includes regulating and overseeing all aspects of military aviation to ensure the safety of personnel, prevent loss or damage of equipment, and enable the successful completion of airworthiness operations.

The primary role of the Technical Airworthiness Authority (TAA) is to regulate and certify equipment as well as organizations involved in the design, manufacturing, maintenance and materiel support of aeronautical products. Specifically, the TAA is responsible for regulating the technical airworthiness aspects of design, manufacturing, maintenance and materiel support of aeronautical products and assuring the airworthiness acceptability of those products as they enter operational service.

Since the Aeronautics Act is mandated, airworthiness-designated authorities are responsible for ensuring that only trained, qualified and authorized personnel perform airworthiness-related activities. In other words, DND must develop and deliver training that meets the intent of the provisions of the Aeronautics Act.

## The Challenge

To provide the Canadian military aviation community with safe and effective air power, the Directorate of Technical Airworthiness and Engineering Support (DTAES) must adhere to, enforce and improve standards related to Technical Airworthiness Authority (TAA) regulatory and aerospace engineering support services. Since not all engineers and technicians involved with regulatory and aerospace engineering support services have the necessary airworthiness knowledge and experience to adequately perform their duties, training and on the job experience are needed.

Identifying training requirements was complicated by the fact that Job Tasks and Knowledge/Skills for the 51 Positions within the 8 Sections responsible for AW implementation had not been defined. As a result, training needed to support AW activities and functions had not been developed nor delivered in accordance with Canadian Forces Individual Training and Education System (CFITES). The ad-hoc approach for developing and delivering AW training programs failed to provide the consistency demanded by CFITES.

### Solution

To identify training needs, high level Tasks performed by each of the 51 AW positions were identified and uploaded to ADVISOR Enterprise. A comparison of the Knowledge and Skills required by various Positions, revealed that similar duties were performed by multiple Positions. To minimize duplication, Competencies required by each Position were identified.

To identify Tasks, Knowledge/Skills and Training Requirements for each Competency as well as validate who required each Competency, leads within each Office of Primary Interest (OPI) were interviewed to identify: (a) the reasoning behind the courses; (b) the target audience for each course, (c) how each group applied the acquired Knowledge/Skills; (d) the level of Competency that participants were expected to achieve upon course completion; (e) prerequisites; (f) material level of complexity; (g) instructional strategies and (h) throughput.

Based on the analysis of collected data, a number of modifications to the courses were proposed to maximize training efficiency, namely (a) Offer the right training to the right individuals at the right time; (b) Minimize overlap – i.e., avoid unnecessary repetition of same material within multiple courses; and (c) Minimize over training – i.e., minimize material that does not add value to the target audience.

The number of individuals that required training in Steady State was forecasted based on the number of military, government and contractor employees within each of the 51 AW Positions and average turnover rates; and reconciled with historical data. The viability of using Classroom, self-study Computer Based Training (CBT) as well as Virtual Classroom for the delivery of training was assessed by mapping course content, instructional strategies and testing requirements of each course to media's ability in meeting the instructional requirements.

Category	Media	Instructional Objectives/Outcomes	Design Constraints	Delivery	Activities	Evaluation & Feedback
Instructor-led	Instructor-led Classroom	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Instructor-led On-location [On-the-Job]	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Instructor with Computers [Electronic Mediated Classroom]	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
Print	Print	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Print with Computer	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Print with Equipment	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
Tapes	Audio Tapes [MP3] [Pod] [with Handouts]	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Video Tapes [DVD]	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Video Tapes [DVD] with Computers	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
CBT/WBT	Level 1 Interactive Courseware (ICW) - Passive	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Level 2 Interactive Courseware (ICW) - Limited Participation	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Level 3 Interactive Courseware (ICW) - Complex Participation	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
eLearning	Mobile Learning (Feature Phones)	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Mobile Learning (Smart Phones)	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Mobile Learning (Tablets)	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
Social Learning	Wiki	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Micro-Blog [Twitter]	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Social Network [Facebook or LinkedIn]	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
EPSS	Intelligent Tutor	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Embedded Training Appended	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Fully Embedded Training	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
Conferencing	Audio Conferencing (with Handouts)	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Computer Conferencing	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
	Video Conferencing	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives
Internet	Internet Virtual Classroom [Virtual Learning Space]	Support Multiple Objectives	Accommodate Trainers with Limited Reading Ability	Support Multiple Objectives	Support Multiple Objectives	Support Multiple Objectives

The costs of viable options were then forecasted and compared to identify the most cost effective blend of delivery options.

## Results

To meet Airworthiness training requirements, i.e., attain the Competencies needed to perform duties, nineteen (19) courses were recommended for the 51 AW Positions. Three blended delivery options that met training requirements were outlined. (1) Classroom Option: offered low start-up costs and high level of interactivity; (2) Blended Classroom with Virtual Classroom Strategy: maintained high level of interactivity while minimizing travel costs; and (3) Highly Scalable Classroom, Virtual Classroom and Computer Based Training Strategy: offered interactivity where needed and provided the best overall value – and in-turn leading to over \$800,000 in potential savings.

Course #	Course Title	Option 1	Option 2	Option 3
1a	AW Technical Familiarization Course (Overview AGA)	CBT	CBT	CBT
1b	AW Technical Familiarization Course (Overview AGA)	Classroom	Classroom	Classroom
2	Technical AW Program - Initial	Classroom	Classroom	CBT
3	Technical AW Program - Continuing Airworthiness	Classroom	Classroom	CBT
4	RARM (Record of AW Risk Management)	Classroom	Virtual Class	Virtual Class
5	SDE (Senior Design Engineering )	Classroom	Classroom	Classroom
6	Approved Flight Manual Specialists (AFMS) Training Course	Classroom	Classroom	CBT
7	DND Airworthiness Certification Specialty	Classroom	Classroom	Classroom
8	Technical Airworthiness Clearance (TAC) For Major Capital Projects	Classroom	Classroom	Classroom
9	Air Test & Evaluation (Tasking & Coordination of DND Resources)(T&E)	Classroom	Virtual Class	Virtual Class
10	Aircraft System Safety Course	Classroom	Virtual Class	CBT & Virtual Class
11	Type Design Examination (TDE)	Classroom	Classroom	Classroom
12	Findings of Compliance	Classroom	Classroom	Classroom
13	Airborne Software & Electronic Hardware (ASW / AEH) Certification - General	Classroom	Classroom	Classroom
14	Airborne Software & Electronic Hardware (ASW / AEH) Certification - Specialist	Classroom	Virtual Class	Virtual Class
15a	Stores Clearance Certification - General	Classroom	Virtual Class	Virtual Class
15b	Stores Clearance Certification - Specialty	Classroom	Virtual Class	Virtual Class
16a	E3 - Theory	Classroom	Virtual Class	Virtual Class
16b	E3 - OJT	OJT	OJT	OJT
17	P12	Classroom	Classroom	Classroom
18	Transport Canada (TC)	Classroom	Classroom	Classroom
19	Performance Based Navigation (PBN) RNAV & RNP	Classroom	Virtual Class	CBT
	<b>Start-up Cost: Development</b>	<b>\$523,294</b>	<b>\$593,427</b>	<b>\$1,046,174</b>
	<b>Recurring Cost Steady State</b>	<b>\$397,773</b>	<b>\$349,708</b>	<b>\$341,174</b>
	<b>Total Cost (over 10 years)</b>	<b>\$4,524,693</b>	<b>\$4,177,862</b>	<b>\$4,533,563</b>
	<b>Annual Trainee Productivity</b>	-	-	\$81,472
	<b>Total Trainee Productivity (over 10 year)</b>	-	-	\$814,720
	<b>Net Value</b>	<b>\$4,524,693</b>	<b>\$4,177,862</b>	<b>\$3,718,843</b>

## CONTACT INFORMATION

For more information on this project, or how ADVISOR can assist you in managing training budgets and resources as well as clients' needs and expectations, please contact:

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