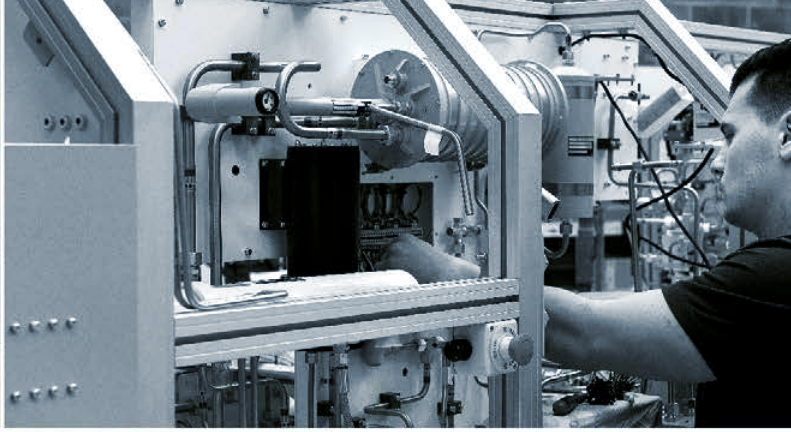
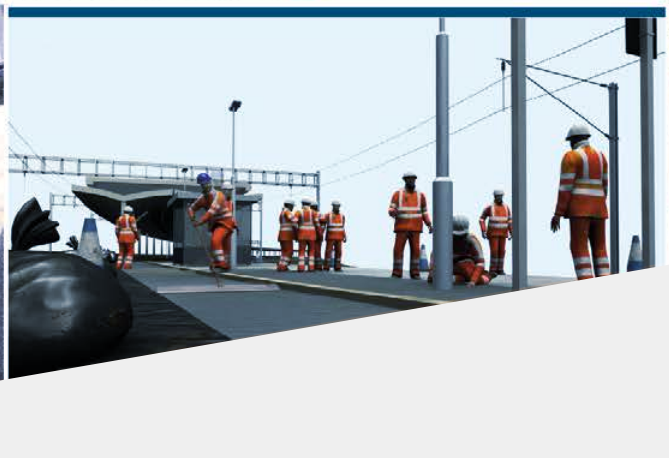
Pennant

World-class products and services which train and assist operators and maintainers





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OVERVIEW

Pennant International Group Plc is a leading provider of technical training solutions to Defence, Aerospace, and safety critical industries in the UK and overseas. An established supplier to the UK MoD and other major Defence contractors, Pennant has a proven capability in the Design, Development, Manufacture, Delivery and Support of technical training solutions and services including:-

- Alignment with training regulations such as AESA/EMAR PT 66, FAA, City & Guilds & CASA MEA
- Translating and developing a training requirement into a deliverable product
- Providing subject matter expertise in specialist and technical areas
- Operator and maintainer training within an engineering or related environment
- Hardware and software capabilities
- Through Life Support & Services (Integrated Logistics Support)

Pennant equipment offers a modern, blended training solution enabling ab-initio students to benefit from a suite of modern, generic and bespoke training aids offering operation and maintenance savings and improved safety outcomes. These training aids complement training on real equipment and include basic hand skills devices, virtual reality trainers and maintenance emulators for regulated sectors.

Students move on and complete their training on high end type trainers utilising the skills they learnt in the school house, lessening the step across to working on the real equipment.

> “I’m proud to be part of a company with a rich heritage and one which has very much moved with the times. Looking to the future, I believe the business is well placed to deliver further growth and innovation, continuing to develop new technical training solutions and services as we enter the next phase in Pennant’s long and distinguished history.”
>
> Philip Walker, Group CEO

HISTORY

Pennant International Limited was established over 60 years ago.

The Group is listed on the London Stock Exchange's AIM market and operates worldwide, with offices in Europe, North America and Australasia. The Group exports its range of technical training solutions around the world to train the next generation of operators and maintainers in defence and regulated civilian sectors.

The company has evolved over the past six decades, from modest beginnings into a market-leading, technology-led business with a truly global customer base. From animated displays using patented light systems to today's sophisticated software training systems, early projects included working with Sir Christopher Cockerell to produce prototype designs of the world's first Hovercraft. In 1965 Brian Crawford and David Henderson joined the company and introduced new technology which opened up the markets of education and training.

These developments resulted in substantial growth for Pennant, with demand for procedural and maintenance trainers for civil and military equipment. The company embraced technology by taking on larger programmes and producing ever more sophisticated software solutions, including Omega PS LSAR software.

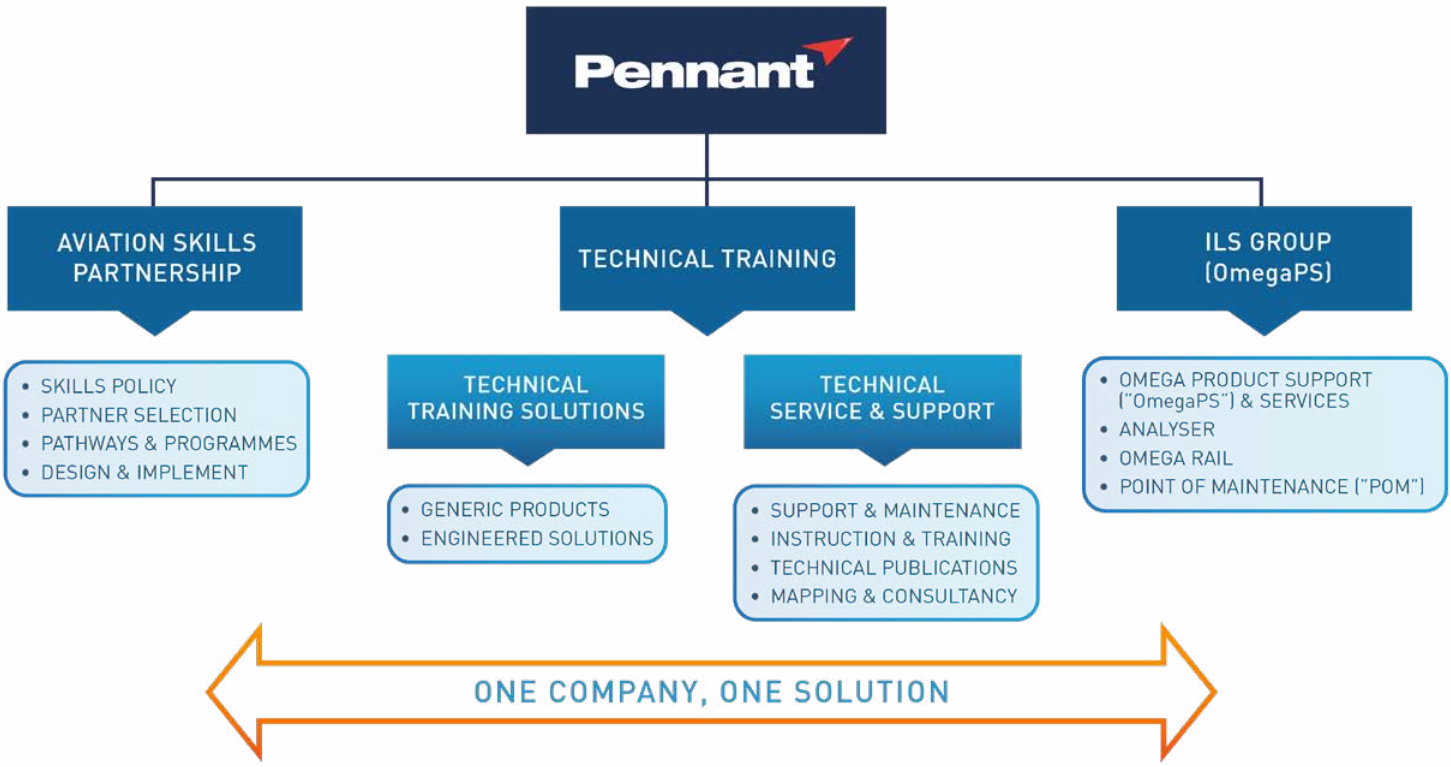
Today, Pennant has become a firmly established world leading supplier of training products and services, supported by a creative, innovative and highly trained team.

OUR VISION

To be the provider of choice for world-class products and services which train and assist operators and maintainers in both the defence and regulated civilian sectors.

- **INNOVATION** - Make World Class Products
- **CUSTOMER FOCUS** - Provide Excellent Services
- **DIVERSIFICATION** - Grow Civil
- **CORPORATE DEVELOPMENT** - New Markets, New Ventures

OUR CAPABILITIES



GROUP STRUCTURE

OUR FACILITIES

Pennant has over 200 staff working across sites in the United Kingdom, North America, Middle East and Australasia. Our facilities contain over 60,000 sq.ft of production capacity, which has quadrupled since 2005.

Pennant's head office is based in **Cheltenham UK**; featuring units, production space, demo suite and modern offices. In the United Kingdom, Pennant also has offices in **Manchester** and **Fareham**. In **Ottawa,** Canada, Pennant has an office specialising in LSAR Software and services and, in Australia Pennant has two locations - an office in **Melbourne** and an engineering site in **Wagga, Wagga**. In February 2019 Pennant completed the acquisition of Aviation Skills Partnership (ASP) with facilities based in **Norwich, UK** and will be opening up a **Middle East** office in Q3 2019.

Ottawa, Canada

Pennant Australia - Wagga, Wagga

Pennant Australia - Melbourne

Aviation Skills Holding

Aviation Skills Partnership
Norwich

Manchester, UK

Norwich, UK

Fareham, UK

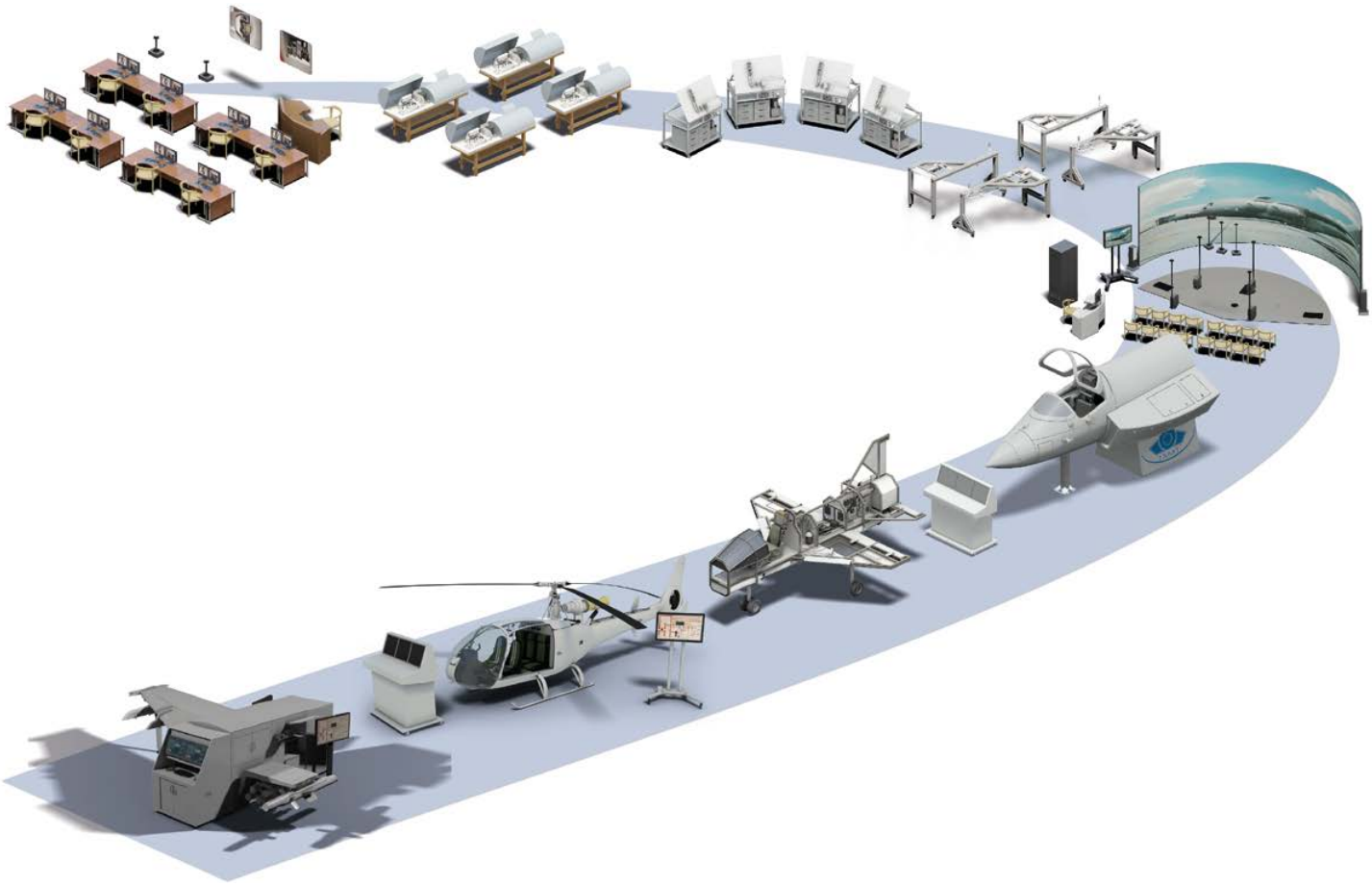
Head Office - Cheltenham, UK

TECHNICAL TRAINING SOLUTIONS

Pennant specialise in generic and platform specific (engineered solutions) based on real or simulated military equipment interfaced with simulation computers and instructor control facilities.

GENERIC TRAINERS

Pennant's range of generic training equipment offers a blended solution enabling ab-initio students to benefit from a suite of modern, generic training aids which provide operation and maintenance savings and improved safety issues. These training aids include: basic hand skills devices, virtual reality solutions, desktop emulators and mechanical systems for practicing maintenance and fault finding activities.



ENGINEERED SOLUTIONS

In addition to the suite of generic training products, Pennant has an experienced team of hardware and software engineers that analyse, design and manufacture bespoke engineering solutions to satisfy training needs. This equipment can be platform specific or custom-built, and can include simulators, part-task trainers and procedural trainers for both defence and civil customers.

COMPUTER BASED TRAINING

Pennant has been at the forefront of distributed learning in the form of web and server-based e-learning, with Computer Based Training (CBT) and Computer Aided Intruction (CAI) applications providing consultancy and developing new strategies, practices and technology in collaboration with government departments and industry across the world.

VIRTUAL REALITY TRAINING

Increasingly, training establishments are relying on virtual reality to transition between theoretical and practical exercises in procedural training. With a suite of impressive solutions, Pennant delivers innovative, effective and high-quality training which allows multiple users to inject real-time faults, practice emergency solutions, record responses and review activity easily and safely.

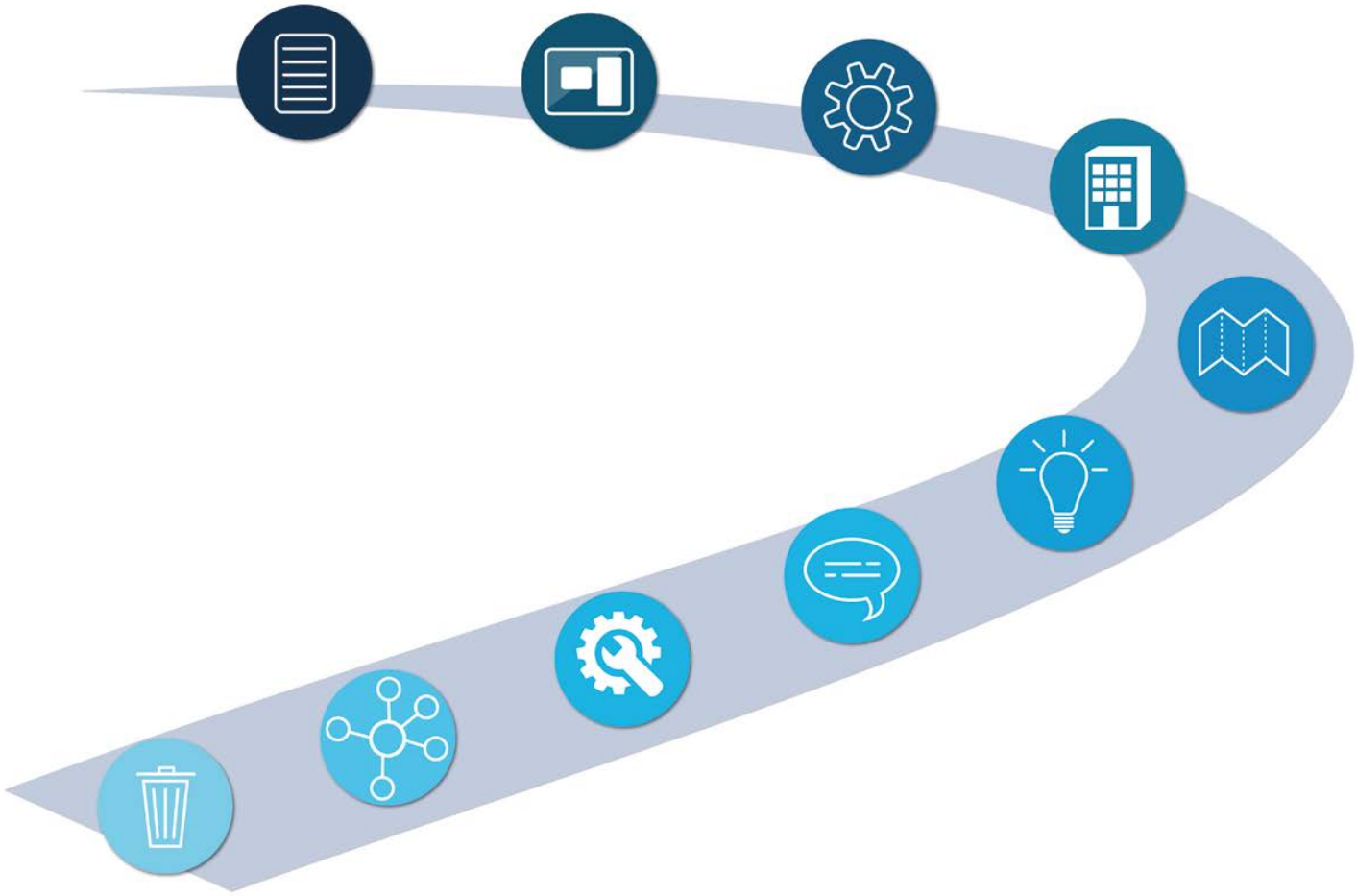
TECHNICAL SERVICES & SUPPORT

CAPABILITIES

Our capabilities include:

- Training Needs Analysis (TNA)
- Courseware Development
- Technical Publications, IETMS, S1000D etc.
- Facilities Planning
- Competency Mapping to EASA, EMAR, City of Guilds etc.
- In Service Support, Preventative and Corrective Maintenance
- Instruction and Training
- Consultancy
- Spares and Obsolescence Management
- Dismantling and Disposal

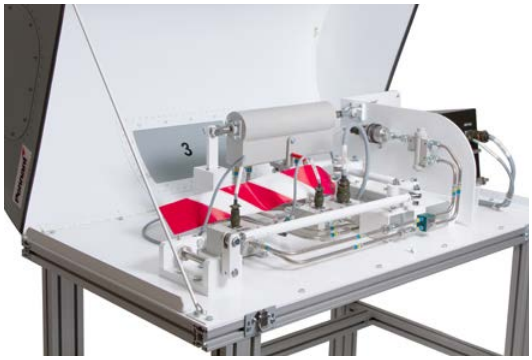
Pennant takes a "Through Life Support" approach to Technical Services and Support for both Pennant and third party training systems in the regulated sectors. From TNA Development to final disposal, Pennant can plan, implement and manage every stage of your support life cycle.



CASE STUDY - DEFENCE AEROSKILLS TRAINING ACADEMY (RAAF BASE WAGGA)

2012

- Embedded with Customer to develop TNA

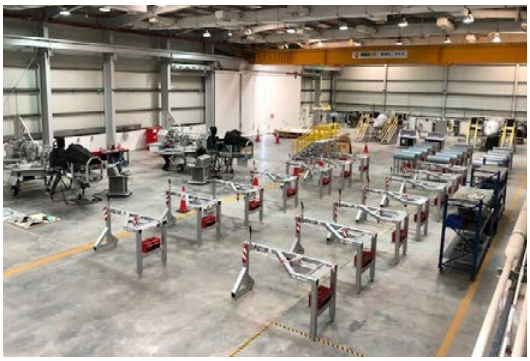


2013

- Contract Award (Rolling Annual Contract)
- Refurbished existing Training Aids
- HazMat Remediation - Disposed of obsolete equipment
- Delivered modern training aids, Pennant and third party
- Created instructor and student resource (Media)

2014

- Support of 4,000+ items of training equipment from hand tools to ground run aircraft



2016

- Created over 100 instructional videos, from hand skills to aircraft movements

2017

- Provided Instructor and Developer resource

2018

- Mapping to MEA training requirements and development of type training

2019

- Supporting the introduction of new airframes

2020

- Undertaking deep maintenance and product refresh

INTEGRATED LOGISTICS SUPPORT (ILS)

Pennant is proud to produce innovative Integrated Logistics Support (ILS) software solutions that are incorporated within our OmegaPS Suite. Our software is sold world wide, and offers industry and government users a suite of applications to efficiently manage logistic support data, and to conduct leading edge supportability analyses that enable optimized equipment support decisions over the entire product life cycle. With a focus on client requirements, Pennant has a proven track record and can help save organizations time and resources managing their equipment product support information sets. Our consultants can assist users in effective management of product support enabled by our software.

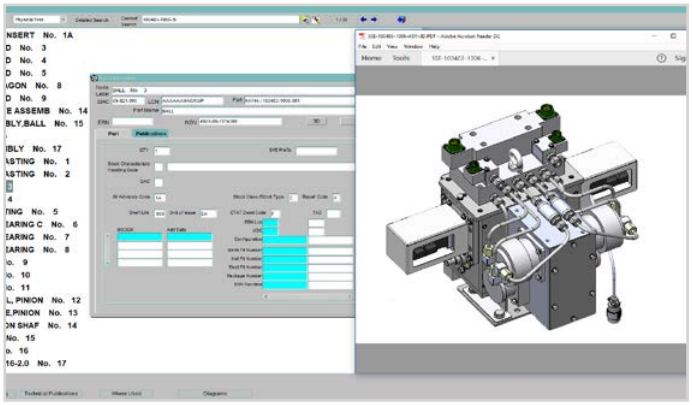
OMEGAPS SOFTWARE

OmegaPS is an integrated database that efficiently organizes logistics data as it is defined and managed throughout the equipment life-cycle. It contains all the logistic product support information – both vendor and client data - that describes the equipment your organization manages, including how it is maintained, and how to fix it should it fail. Other features include:

- Manages Logistics Support Analysis (LSA) data in accordance with SAE-GEIASTD 0007, Mil Std 1388-2B, Def Stan 0060 and Def Aust 5692. It is also compatible with S3000L Standards
- Maintain detailed configuration of complex equipment
- Identifies how to fix or prevent failures (planned maintenance tasks)
- Identifies how often each maintenance action will occur
- Interfaces with ERP Systems
- Compatible with S1000D publishing standard

OMEGA PS ANALYZER

OmegaPS Analyzer is a Windows based product that provides the power of an intuitive GUI and the sophistication of embedded and proven Canadian Department of National Defence algorithms. The primary functions include Life Cycle Cost (LCC) Optimization, Level of Repair Analysis (LORA), Spares Optimization, and Availability Modelling. Key features include:



- Make support decisions based upon proven data algorithms
- Support operational availability design review assessments
- Simulate availability impacts across multiple mission scenarios
- Optimize spare part inventory holdings
- Determine the most cost-efficient in-service support approach
- Conduct sensitivity analysis to support risk assessment
- Attribution of costs to customized cost breakdown structures

CURRENT OMEGA PS USERS:

BAE SYSTEMS
aselsan
babcock
AIRBUS
COBHAM
TURKISH AEROSPACE
THALES
Défense nationale / National Defence
Australian Government Department of Defence
BOEING
Huntington Ingalls Industries
MBDA MISSILE SYSTEMS
indra
CAE
FUJITSU
CACI EVER VIGILANT
fleetway
GENERAL DYNAMICS Mission Systems–Canada
L3 Technologies
STADLER
RHEINMETALL DEFENCE
LOCKHEED MARTIN
OSHKOSH
T-Systems
IMI GROUP
SAAB
LEONARDO DRS
SAGEM

TECHNICAL PUBLICATIONS

Pennant has been at the forefront of the Technical Publications industry from the days of paper to these days of evolving digital technology, providing an almost limitless potential for information transfer.

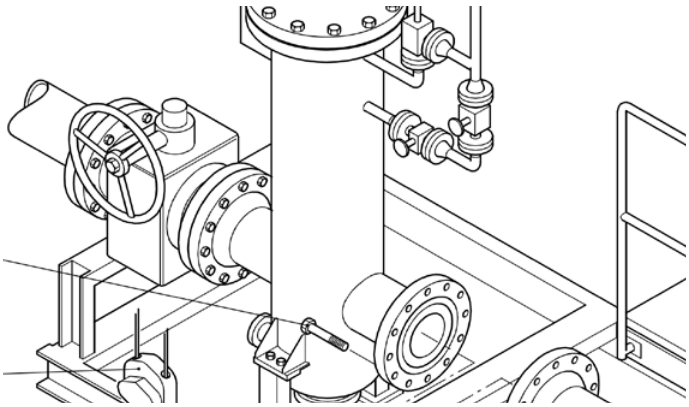
Technical Publications is the conversion of a range of frequently complex source technical data into User Handbooks, Operation & Maintenance Manuals, Parts Catalogues, training courseware etc. It has always been a highly specialised industry, employing technical authors, illustrators, compilers and instructional designers: a significant team of specialists.

Collaborating with Pennant benefits our clients in many ways, including reduced employment costs and access to our extensive experience and expertise. We are proud of our hard-won reputation across a wide range of industry sectors including:

- Defence
- Aerospace
- Rail
- Power Generation
- Government departments

We have adopted the ADG R4i product for the development of S1000D compliant XML data modules. Along with a CSDB, these form the building blocks of interactive electronic technical publications (IETPs).

Equally, our illustration and design facilities utilize the latest digital tools for creation of 3D models, vector illustrations and interactive imagery, frequently using the CAD data direct from the client



AVIATION SKILLS PARTNERSHIP (ASP)

In February 2019, Pennant completed the acquisition of the organisation Aviation Skills Partnership ("ASP").

ASP is dedicated to making the aviation industry accessible to all, through transforming career pathways and the approach to aviation skills. ASP's mission is to continuously improve the education and training opportunities leading to, and within the aviation sector, ensuring that the right people have the right skills, to get the right job. If you're seeking a profession in the aviation industry, ASP will connect you to the right pathway to enable you to achieve your dream career.

In the UK, the aviation industry faces strong growth both in a civil and defence capacity. Whilst the industry enjoys high levels of engagement and enthusiasm there is often a missed opportunity as this enthusiasm is not channeled into an aviation career.

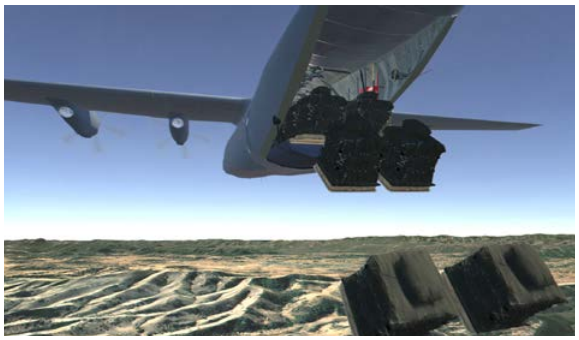
ASP identified a need to ensure that pathways to the industry become clearly identifiable from a young age, and works with four main audiences to deliver its manifesto across the regions:

- Aviation employers / industry
- Pupils / Parents
- Educators / Trainers
- Government / Regulators

NEW SOLUTIONS

VIRTUAL LOADMASTER TRAINING SYSTEM (VLTS)

- Trainer supports EASA Part 66 training modules
- Developed in association with Capewell Aerial Systems LLC, a US based market leader in aerial delivery equipment
- First airdrop simulation developed specifically for C-130 Loadmasters
- Designed to enhance training by giving students experience in the full spectrum of operations, from normal procedures, to critical airdrop emergencies
- Product launched at ITEC 2018 & sold to US Air National Guard



BASIC HELICOPTER MAINTENANCE TRAINER (BHMT)

- Free standing helicopter trainer
- Refurbished airframe with open cockpit
- Mix of high fidelity replica & real aircraft components
- Practise maintenance procedures
- IOS to monitor student activity & input faults
- Trainer supports EASA Part 66 training modules

GENERIC STORES LOADING TRAINER (GSLT)

- Trainer supports EASA Part 66 training modules
- Proven Pennant product in service with Royal Navy since 1993
- Generic Part Task Trainer
- Fixed and Rotary Wing configuration supports simulation training on both wings
- Animated schematics allow user to view weapon control circuits
- Instructor Operating System (IOS) enables scenarios to be set, faults to be injected & student progress to be monitored
- Carry out procedures for loading & unloading weapons in a safe environment

OMEGA PS RAIL

- A new innovative software product designed to enable manufacturers and owner/operators of complex rail equipment to reduce costs
- Complies with EN 15380, EN 50126, DIN EN 60812, DIN EN 60300-3-11 Standards
- Linked to OmegaPS Analyzer - LCC, LoRA & Spares optimisation modelling
- Excel & XML input and output

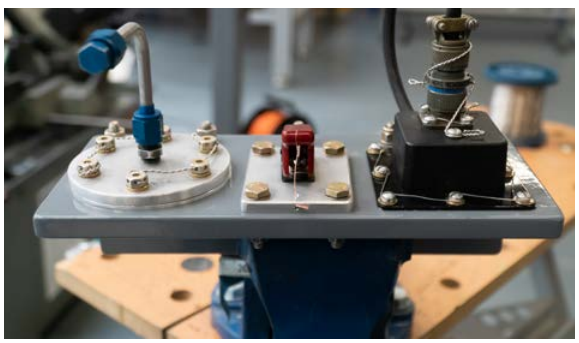
NEW SOLUTIONS

GENERIC MAINTENANCE TRAINER (GenSkill) MK2

- Trainer supports EASA/EMAR PT 66, FAA, City & Guilds and CASA MEA Units
- The MK2 builds and enhances on the training capability of the standard GenSkill
- Functioning low voltage aircraft circuit and fabrication
- The MK2 modification can be easily added to existing GenSkills

GENERIC FASTENER INSTALLATION TRAINER (GFIT)

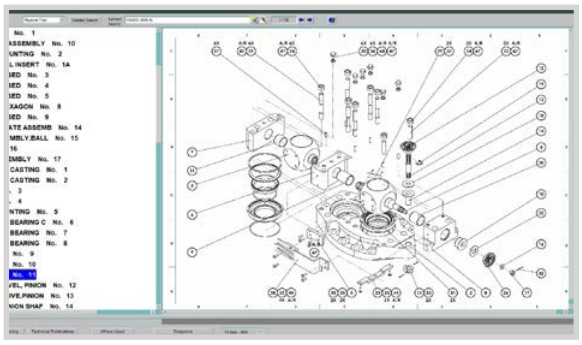
- Trainer supports EASA/EMAR PT 66, FAA, City & Guilds and CASA MEA Units
- The Generic Fastener Installation Trainer (GFIT) provides each student with the initial cognitive and manipulative skills required for accurate hardware assembly
- Aligned to a number of national training curricula
- Easily portable
- Builds on student's hand skills knowledge

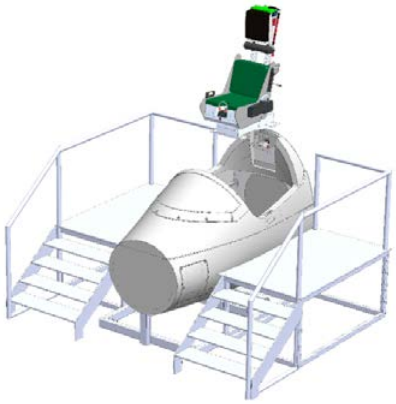


FUTURE INNOVATION

Pennant is continually reviewing the training market to identify any gaps or opportunities where the enhancement to an existing system or addition of a new product can enhance Pennant's offering. The company takes on board feedback from its customer base and ideas from its own team to drive future innovation. The following examples highlight the investment being made in the development to hardware, software and VR products:

- Virtual Ground-handling Training System
- Engine Starting System Trainer
- Crew Escape System Trainer
- Omega PS Rail - Point of Maintenance ("POM")





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