



Tenix Defence Pty Ltd

Tenix Defence is the largest Australian-owned defence contractor serving local and international markets. Tenix Defence provides complete development and support solutions for naval, airborne and land platforms, in addition to being a leading contractor in the growing field of information systems and network enabled solutions. Tenix Defence is organised in four Divisions:



Aerospace Division

- Domain expertise and AEO/AMO status for a broad range of fixed and rotary wing aircraft
- Partnerships and solutions for platform and system Through Life Support (TLS)
- Specialist in Aircraft Systems and Airframe Engineering design, development and modification
- Expertise in aircraft systems Safety, Test, Evaluation and Certification
- Proven capability in Project Management and Integrated Logistics Support.



Electronic Systems Division

- Domain expertise in Intelligence, Surveillance, Reconnaissance & Electronic Warfare
- Strong focus on emerging Network Centric Warfare concepts and application development
- A leading provider of Geospatial Solutions
- Network Enabled and National Security Systems for the future
- Specialists in R&D, technology and products for domestic and global markets.



Land Division

- Engineering and project management services for upgrade and repair to a wide range of military vehicles
- Comprehensive TLS and heavy vehicle maintenance under quality assurance framework
- Protection and armouring of police, diplomatic and commercial vehicles
- Production of S600 light armoured vehicle for internal security applications
- Provision of Garrison Support Services to defence and industry.



Marine Division

- Whole-of-capability approach to ship design, construction, and TLS
- Expert in the management of prime contracts, integration partners, and suppliers
- Unparalleled record in delivering quality platforms and systems on time and to cost
- Cost-effective and innovative solutions to complex naval requirements and opportunities
- Regional export success. Global recognition.

For further information, visit our website at www.tenix.com

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SPD1739

For innovative solutions



TenixDefence

AEROSPACE

Aerospace Capabilities



Supportforlife



Aircraft Systems Design and Integration

Tenix Defence Aerospace Division has the comprehensive capability to conduct wide ranging system design and development, integration, test, operation and support activities. This capability is well recognised in Australia and accords with world's-best practice.

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AP-3C Orion

AP-3C Orion FLIR turret

S-70B-2 Seahawk
FLIR display

S-70B-2 Seahawk

The Division has significant skills in Defence-related Mission System integration activities and has experience in aircraft and ground-based radar systems. The Division has the capability and resources to:

- Analyse a customer's operational and performance requirements
- Evaluate sensor, communication and mission sub-systems
- Design, integrate, install, test and support cost-effective system solutions.

Tenix Defence is currently contracted for a number of significant military programs for ADF aircraft platforms (fixed and rotary wing), which include systems design, installation, integration and test activities.

Examples of current and completed projects include:

- RAAF P3 AQS 901 Acoustics Processing Modification
- RAN SEA 1405 Seahawk Upgrade
- RAAF AIR 5416 Project Echidna Phase 2B, C-130H EWSP
- RAAF AIR 5276 Phase 2A, P-3C Modification/Engineering Support
- RAAF AIR 5375 Tactical Air Defence Radar System (TADRS)
- AIR 5418 Follow-On Stand-Off Weapon for AP-3C
- JP 2070 Djimindi, Light Weight Torpedo for AP-3C
- AP-3C Integrated Test & Training Facility, software and hardware modification, maintenance & support
- AIR 5276 Phase 4, EWSP for AP-3C
- AIR 5276 Phase 5A, Interim EO capability for AP-3C
- Maintenance Diagnostics & Service Life Monitoring for F/A-18
- F-111G Digital Flight Control System (DFCS) Installation/Modification
- RAAF B707 Air-to-Air Refuelling and Avionics Upgrade
- RAAF F-111 Avionics Update Program (AUP)
- RAN S-70B-2 Acoustic Data Recorder (ADR)
- RAAF AIR5077 – Airborne Early Warning and Control (AEW&C) Initial Design Activity
- RAAF AIR 5140 P-3C ESM Upgrade

Strengthening Partnerships Fostering Collaboration

Support for the long haul

Building on almost six decades of experience in the Australian aviation industry, Tenix Defence Aerospace Division is a major specialist service provider in the Australian Defence industry.

The Division holds ISO9001:2000 accreditation, Authorised Engineering Organisation (AEO) Certification to conduct design on a variety of Defence aircraft, and Australian Department of Defence (DoD) certification for Earned Value Management.

More than 220 highly trained technical engineering staff are committed to the adoption of CMMI (Capability Maturity Model Integration) as the best process improvement model available for product and service development and maintenance.

They currently deliver world's-best-practice standards of productivity and quality in the fields of:

- Project management, particularly of major Defence aerospace projects
- Systems design, including all aspects of aircraft, avionics and mission systems
- Systems integration
- Aircraft engineering and modification
- Aircraft integration design and installation
- Development and execution of ground, flight and systems test programs

- Integrated logistic support, program development and implementation

- Through Life Support program development and implementation.

The Division is managed from Melbourne, and has its own hangar at Melbourne Airport. It also currently works on projects with the Australian Defence Force (ADF) on-site at HMAS ALBATROSS at Nowra, NSW, RAAF Williamstown, NSW, and RAAF Edinburgh, SA.

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RAN S-70B-2 currently being upgraded by Tenix Defence Aerospace



CASE STUDY: SEA 1405 SEAHAWK UPGRADE

Tenix Defence Aerospace Division is the Prime Contractor for the installation of a Forward Looking Infra-Red (FLIR) System and an Electronic Support Measures (ESM) suite for the RAN fleet of 16 S-70B-2 Seahawk helicopters.

This includes installing a Radar Warning Receiver (RWR), Missile Approach Warning System (MAWS) and Counter Measures Dispensing System (CMDS). Tenix is responsible for:

- Program management
- Systems engineering
- Installation design
- Prototype aircraft installation and test
- Fleet modification
- Integrated logistic support.

The project requires major modifications to the airframe to incorporate sensors and electronics equipment associated with the new systems.

The equipment installed includes:

- FLIR – AAQ 27 (3FOV) provided by Raytheon
- ESM/RWR – AES 210 provided by Elisra
- MAWS – AAR 54 provided by Northrop Grumman
- CMDS – ALE 47 provided by Tracor

The Division is responsible for all aspects of the airframe design and engineering, as well as upgrades of the Mission Simulator, Software Support Facility and flight test.

Air-Platform Engineering and Modification

The Division has a comprehensive range of skills and experience in conducting Airframe Engineering activities. These capabilities range from conceptual to detailed design, modification kit manufacture, installation, test and trials, and in-service support.

The Division has its own installation facility at Melbourne Airport but also has the flexibility to set up and operate facilities on-site at our customers' bases when required.

Disciplines provided by the Aerospace Engineering group include:

- Aerodynamics
- Structural design
- Weights engineering
- Mechanical and hydraulic systems design
- Electrical and avionics systems design

- Ground and flight test
- Environmental control system design
- Systems engineering, integration, installation and test
- Computer systems and software engineering and design
- Mission systems
- Human factors and safety engineering
- Modelling and simulation (including statistics and risk analysis).

The Division is currently Prime Contractor for a number of significant ADF military programs which include substantial airframe engineering activities. This work requires modification to airborne structures and airframes, as well as responsibility for associated design and engineering aspects.

Aircraft Modifications

The Division is experienced in the conduct of all aspects of avionics system integration and installation activities, including manufacture of electrical wiring and harnesses.

The Division has successfully delivered a wide variety of projects for the ADF, and has substantial experience on significant military programs requiring avionics integration and engineering activities, such as AP-3C support and maintenance, and Projects SEA 1405, AIR 5401 and AIR 5276.

In AIR 5401, the Division was the prime contractor for the delivery of an upgraded Radar Warning capability for four of the RAAF C-130H aircraft. The Division was responsible for all aspects of the airframe design and modifications that incorporated antennas, countermeasure dispensers and electronics equipment associated with the new system.

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RAAF C-130H Aircraft undergoing modifications at Tenix Defence Tullamarine facility



Aircraft Through Life Support (TLS)

The Division has significant TLS capabilities, as evidenced by its continuing delivery of skilled airframe fatigue monitoring services to the RAAF F/A-18 fleet. Backed by ISO9001 accreditation for software development, the Division's F/A-18 responsibilities include:

- Operation of a suite of software tools and the reporting of fatigue data to the RAAF engineering and operational staff, as well as the Defence Science and Technology Organisation (DSTO). (Fatigue information on the F404 engines is also gathered for engineering management of 27 "lifer" components)
- Development and operation of the MD&SLMS (Maintenance, Diagnostics and Service Life Monitoring System), an off-line batch processing system with an Oracle database as its primary repository of reduced information, with PCs networked for software development. The F/A-18 MD&SLMS system is currently interfaced to the Defence Restricted Network (DRN) and the Computer-Aided Maintenance Management system (CMM2).

The Division also maintains AEO status with the RAAF for the operation, maintenance and ongoing development of all the F/A-18 fleet's hardware.

In addition, the Division has developed a suite of diagnostic software tools (DART) that provide RAAF operators with the capability to conduct detailed investigations into both generic aircraft operational characteristics and the causes of specific aircraft incidents.

Aircraft Systems Test and Evaluation

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New Caption

The Division has the skills, staff and experience to manage and conduct complete system and aircraft testing. New systems can be functionally tested in a laboratory test phase prior to ground and flight testing of the mission or weapon systems installed on the aircraft.

The Division also has the proven capability to gather and analyse data to ensure airworthiness of modified aircraft and to plan and conduct flight test programmes. It is involved in the conduct, planning and management of all aspects of testing associated with systems integration tasks, including:

- Antenna placement analysis and testing
- Flow balance analysis
- EM emission control (EMCON), electrostatics (P-Static) and tempest testing
- Heat load modelling and predictions
- Software testing
- Aircraft cabin temperature surveys
- Testing for electromagnetic interference, compatibility and vulnerability (EMI, EMC and EMV)
- Airborne data acquisition systems testing.

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Tenix Defence Aerospace Division production facility



Integrated Logistic Support

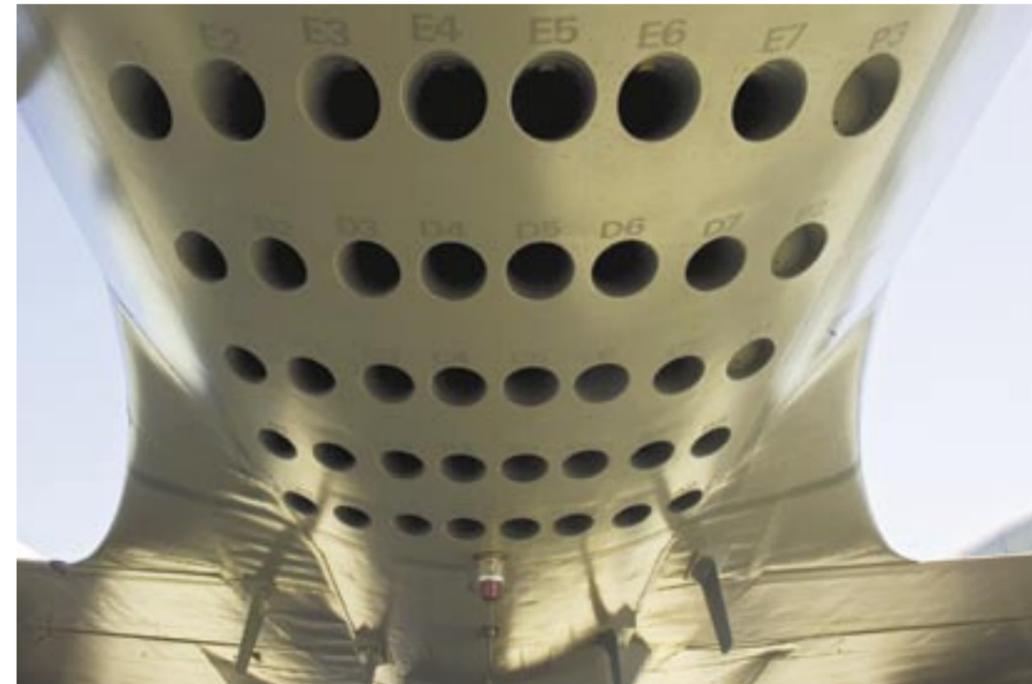
The Division is able to provide a complete range of Integrated Logistic Support (ILS) services, including:

- A comprehensive Logistics Support Analysis (LSA) service, which accords with DEF (AUST) 561 and Logistics Support Analysis Reporting (LSAR) software, meeting the requirements of DEF (AUST) 5692
- Reliability and Maintainability Analysis to MIL-STD's 470, 471, 785, 781 756, and MIL-HDBK's 217 and 472
- Maintenance Requirement Determination in accordance with AAP 7001.038
- Spares Modelling and Analysis using OPUS 10
- Training development and conduct to ACTRAC in AAP 2002.001 requirements

- Publication development to S1000D and DEF(AUST)5629
- Provisioning to accord with Defence Supply Chain Manual.

ILS activities are being undertaken on all major Aerospace Division projects, including upgrading the S-70B-2 Seahawk fleet with a new Electronic Support Measures and Forward Looking Infra-Red system.

Tenix Defence is responsible for the provision of LSA MIL-STD-1388-1A and an LSAR to MIL-STD-1388-2B, reliability and maintainability analysis, spares analysis, publications and publication amendments, training development and training conduct and initial support planning and implementation.



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Engineers verifying systems upgrade of the AP-3C OMS

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RAAF AP-3C Sonar Buoy dispensers

Aerospace Certification, Quality Systems and CMMI

Capability Maturity Model Integration (CMMI)

Tenix Defence is currently undertaking a series of activities and process improvements in order to achieve CMMI level 3 or above, for key Process Areas.

Cost/Schedule Status Reporting

Tenix holds defence certification for its Earned Value Management processes from the DoD. These processes are applied to all Tenix projects, including those for which there are no contract requirements. This is part of the Tenix commitment to sound project cost and schedule performance.

Quality Management Systems

Tenix Defence has independently accredited quality systems. The Aerospace Division Quality Management System (QMS) is certified to ISO9001:2000 by Lloyd's Register Quality Assurance, and has no exclusions to AS/NZS ISO 9001:2000. Certification of the software activities to ISO9001 is conducted using ISO9000-3 or HB90.9 as reference guides. In addition, the Division holds Defence Earned Value Management, Industrial Security Program and a number of AEO certifications.

Quality Certifications

Tenix Defence has a long association with military aircraft modification projects, having held continuous quality certifications since 1940 when Commonwealth Aircraft Corporation received RAAF Approved Firm status. Since then, quality accreditations gained have progressed through AS1821, AS3901 and ISO9001 certifications.

Tenix Defence maintains a current Lloyd's Register Quality Assurance (LRQA) certification to ISO9001:2000, with the following scope:

"Project management, design, development, integrated logistic support, component manufacture, installation, integration, test, repair and maintenance of aircraft, electronic systems and engineering systems for defence applications including software systems development."

Aerospace Division's quality system is certified under the JAS-ANZ accreditation scheme, with software certified to ISO9001 using ISO9000-3 as a reference guide.

Authorised Engineering Organisation (AEO) Certifications

Tenix Defence Aerospace Division holds current AEO certification from the Australian Defence Force's Technical Airworthiness Regulator to conduct design on the following aircraft and associated systems:

- **S-70B-2 Helicopter** – Project Sea 1405 (S-70B-2 Helicopter ESM/ECM & FLIR Upgrade)
- **C-130H Aircraft** – Project Air 5401 (C-130-H Radar Warning Capability)
- **F/A-18 Hornet Aircraft** – F/A-18 Maintenance Diagnostics and Service Life Monitoring System Project
- **P-3 Orion Aircraft** – Provision of engineering and modification support services
- **C-130J Blackhawk and Chinook** – Echidna Initial Design Activity (IDA)
- **C-130H Aircraft** – Electronic Systems Block Upgrade (ESBU)
- **C-130H Electronic Warfare Self Protection (EWSP)**.

Project Management

Tenix Defence is a project-based organisation and its approach to project management is similar, in some respects, to that espoused by the PRINCE 2 methodology (a structured method for effective project management designed to provide a framework covering all disciplines).

Aerospace Division has established a significant project management capability through its involvement in major defence aircraft modification programs, both as a prime and sub-contractor. Team members work to ensure results meet all technical requirements, are on time and within budget. Tenix project management systems comply with the requirements of the Cost/Schedule Control System DEF (AUST) 5657 (CSCS) criteria.