

**Appendix AD of Annex A**

**Maintenance and Support Concept  
for the  
Area Detection and Identification System  
(ADIS)**

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**NOTICE**

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LIST OF ACRONYMS

ADIS	Area Detection and Identification System
ADM	Assistant Deputy Minister
BIT	Built-In-Test
CANSOFCOM	Canadian Special Operations Forces Command
CBRN	Chemical, Biological, Radiological and Nuclear
CAF	Canadian Armed Forces
CFFCA	Canadian Forces Fire & CBRN Academy
CFITES	Canadian Forces Individual Training and Education System
CFSD	Canadian Forces Supply Depot
CFTO	Canadian Forces Technical Orders
CM	Configuration Management
CSA	Configuration Status Accounting
DJCBRND	Director Joint Chemical Biological Radiological, and Nuclear Defence
DCSEM	Director Combat Support Equipment Management
DSC	Defence Supply Chain
DND	Department of National Defence
DSCO	Director Supply Chain Operation
LBS	Logistical Breakdown Structure
EEA	Equipment Environmental Assessment
EO	Electronic-Optronic
FSR	Field Service Representative
ILS	Integrated Logistics Support
IOC	Initial Operational Capability
ISS	In Service Support
IT	Information Technology
LCMM	Life-cycle Materiel Manager
LRU	Line Replaceable Unit
LLTIL	Long Lead Time Items List
Log Stock	Logistical Stock
MX	Repair Parts Manual and Scales
NATO	North Atlantic Treaty Organization

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NSN	NATO Stock Number
Op Stock	Operational Stock
PBL	Product Base Line
PPB	Provisioning Parts Breakdown
RCEMES	Royal Canadian Electrical and Mechanical Engineers School
RSPL	Recommended Spare Parts List
SPTD	Supplementary Provisioning Technical Documentation
SRU	Shop Replaceable Unit
STTE	Special Tools and Test Equipment
TA	Technical Authority
TF	Task Force

## **1. INTRODUCTION**

### **1.1 Scope**

This document describes the maintenance concept for the Canadian Armed Forces (CAF) Area Detection and Identification System (ADIS) as well as providing a high level overview of the equipment life cycle support activities including acquisition and contracted In Service Support (ISS).

### **1.2 Purpose**

This document provides the CAF and the Contractor with information required to develop and implement effective logistics support for ADIS.

## **2. DEFINITIONS**

Line Replaceable Unit (LRU): A unit designated to be removed upon failure from a larger entity (equipment, system) in the operational environment. For the ADIS, an LRU is any item to be replaced by DND.

Shop Replaceable Unit (SRU): An item that is designated to be removed or replaced upon failure from a higher level assembly in the shop (intermediate or depot maintenance activity) and is to be tested as a separate entity. Also referred to as a shop replaceable assembly.

## **3. REFERENCES**

MIL-STD-1309D: Definitions and Terms for Testing, Measurement and Diagnostic

NATO's AECTP-200 (ed 3): Environmental Conditions (Jan 2006)

## **4. MISSION PROFILE**

ADIS will be used for training and for operational deployment throughout the world by the CAF. ADIS will be used for surveillance and early warning of chemical agents in medium and large size perimeters (camps, airfields, harbours, etc.), and may be used to assess the overall contamination following a chemical release. ADIS is a detect-to-warn system and its role is not limited to mobile, fixed sites or static base camps, but also includes semi-static locations, such as formation HQs, detached or forward operating elements.

ADIS will operate in a wide range of climatic conditions from C1 (intermediate cold) to A1 (extreme hot and dry) in accordance with NATO's AECTP-200. Operations could take place in urban or rural terrains.

## **5. USAGE**

ADIS will be engineered for a minimal service life of 10 years. The average usage in hours per year per equipment, including both training and operations, is expected to be approximately 1000 hours. The ADIS design is expected to be highly reliable and maintainable, thereby increasing its availability and reducing the amount of resources required to support it.

Average mission life is anticipated to be 96 hours.

**6. DISTRIBUTION**

DND intends to procure 32 ADIS. The anticipated 32 ADIS distribution is as follows:

Expeditionary Task Force (TF) 1 (See Table1): 8

Expeditionary Task Force (TF) 2 (See Table 1): 8

CANSOFCOM: 10

CFFCA: 2

ADM (Science & Tech): 1

Log/Pre MSN Trg: 3

Distribution for each Task Force is given in Table 1 below.

**Table 1: ADIS allocation to the Expeditionary Task Force 1 and 2**

Formations/Units	Anticipated Allocation
Land Force Elements	
1 x Base Camp x 2 ADIS	2
2 x Recce/Forward Operations x 1 ADIS	2
Naval Task Group	
2 x Ships x 1 ADIS	2
Air Expeditionary Wing	
1 x Airfield x 2 ADIS	2
<b>Total ADIS per Expeditionary TF</b>	<b>8</b>

**7. SUPPORT ORGANIZATIONS**

**7.1 Director Combat Support Equipment Management (DCSEM)**

DCSEM will be the directorate responsible for the Life Cycle Maintenance and ISS needs of ADIS.

**7.2 Canadian Forces Fire & CBRN Academy (CFFCA) Borden**

Initial cadre operator training will be given to CFFCA instructors. CFFCA will take the courseware developed by the Contractor and carry out regenerative training in order to maintain the capability within the CAF (steady state).

**7.3 Royal Canadian Electrical and Mechanical Engineers School (RCEMES)**

Initial cadre maintenance training will be given to RCEMES instructors and applicable members of the various CAF branches who will then take the courseware developed by the Contractor and carry out training and regenerative training within their respective branches in order to maintain the steady state capability within the CAF.

#### **7.4 DND Technicians**

DND Technicians will perform operator and First Line maintenance of the equipment.

#### **7.5 Director Joint Chemical Biological Radiological Nuclear Defence (D JCBRN D)**

D JCBRND will be the Requirements Authority throughout the equipment's life cycle.

#### **7.6 Director Supply Chain Operations (DSCO)**

DSCO will provide guidance, support in cataloguing, technical data, publications, and initial provisioning (IP).

#### **7.7 DND**

DND will obtain spares provisioning, storage, maintenance and management services from the Contractor starting at first ADIS delivery under a separate ISS contract.

### **8. MAINTENANCE CONCEPT**

CAF operators and maintainers will perform operator and first line maintenance activities that do not require:

- a. Any ADIS LRUs to be opened;
- b. The use of special tools and test equipment (STTE); and
- c. Software maintenance.

Maintenance tasks beyond these simple corrective steps will be sent to the Contractor for repair under the ISS contract.

Guidelines to be adhered to, for ADIS maintenance:

1. A faulty LRU will be placed in its transit case, along with all other case contents, and returned to the Contractor for repair;
2. LRUs selected for repairs that are beyond economic repair are not to be scrapped or disposed of without prior approval of the Technical Authority (TA) who will determine whether the LRU should be:
  - a. Repaired even though repair costs may exceed the maximum repair cost ceiling;  
or
  - b. Scrapped.
3. The Contractor will repair the faulty LRU to its full serviceable condition;
4. Long lead time items are to be identified by the Contractor;
5. External manual calibration requiring special equipment will be performed by the Contractor providing ISS;
6. Contractor to clarify if periodic system desiccation is anticipated, or not;
7. A cost effective maintenance support solution must be implemented that ensures ADIS meets operational and availability requirements throughout its life cycle;
8. Maintenance activities must be conducted without increasing human resource requirements;

9. Minimize the requirements for maintenance training, STTE and provisioning support;
10. Sound comprehensive preventive maintenance program as well as completion of repairs as rapidly as possible and as far forward as possible;
11. DND maintenance tasks and activities will only be performed by CAF users and technicians at first line;
12. First line maintenance will consist of the inspection, removal and replacement of damaged, worn, or otherwise unserviceable assemblies/subassemblies (parts) and Line Replaceable Units (LRUs);
13. Damaged or unserviceable assemblies/subassemblies (parts) and LRUs will be returned to the Contractor for repairs through the Defence Supply Chain (DSC);
14. Limit the need to deploy spares;
15. Maximize the use of equipment self-diagnosis technology; and
16. The Contractor recommended, preventive and corrective maintenance tasks will be used as the basis for CAF maintenance activities.

### **8.1 DND Maintenance**

ADIS maintenance concept encompasses maintenance support in which maintenance responsibilities beyond those of CAF operators and First Line maintenance will be returned to the Contractor for repair.

DND will be responsible for maintenance or replacement of Government Furnished Equipment (GFE) such as the radio and hardened laptop.

First line maintenance is maintenance performed by military personnel attached to the units or formations operating the ADIS systems. CAF operators and technicians will perform operator and first line maintenance tasks respectively.

Most maintenance actions will most likely be via removal and replacement of damaged, worn or otherwise unserviceable parts.

Operator maintenance tasks will not require the use of STTE.

Sample Operator maintenance activities include but not limited to:

- a. Non-technical inspections for wear and tear;
- b. Preventive maintenance;
- c. Cleaning;
- d. Initiating equipment self-calibration; and
- e. Additional activities as recommended by the Contractor and agreed to by DND TA.

First line maintenance tasks will require no STTE.

Sample First line maintenance activities performed by CAF technicians include but not limited to:

- a. Serviceability assessments;
- b. Preventive maintenance;
- c. Initiating built-in test (BIT);
- d. Lens cap replacement;



- e. Minor repairs and adjustments such as straps, covers, switch knobs, harness attachments that do not require unit disassembly or STTE;
- f. Library updates using a laptop computer (if allowed by Contractor);
- g. Packaging, preservation and long term storage; and
- h. Additional corrective maintenance tasks as recommended by the Contractor and as agreed to by the TA.

## **8.2 Contractor Maintenance**

Contractor ADIS support under the ISS contract starts from first ADIS delivery.

Contractor maintenance will not include any GFE such as the radio and hardened laptop. GFE items will not be shipped to the Contractor for maintenance.

Faulty ADIS LRUs that require opening, or require the use of STTE will be maintained and managed by the Contractor. The faulty LRU (including all associated ADIS contents) will be packaged in its transit case(s) when sent to the Contractor for repair.

Faulty ADIS LRUs may be sent to the Contractor with missing/damaged first line replaceable parts (e.g. connector caps, lens cap, screws, etc.). In such instances, DND expects the Contractor to replace the missing/damaged items (in addition to repairing any internal LRU faults) so that the ADIS is returned in its full, serviceable and most updated product baseline configuration.

Upon completion of repairs, the serviceable ADIS will be placed in its transit case(s) and returned to DND.

## **9. FACILITIES**

### **9.1 Training Facilities**

The Contractor will utilize existing DND training facilities for all training. Therefore, no special training facilities are anticipated.

### **9.2 Maintenance Facilities**

Existing DND maintenance facilities are considered adequate to perform the first line maintenance activities. No additional DND maintenance facilities are anticipated.

## **10. SUPPLY SUPPORT (SPARES AND REPAIR PARTS)**

### **10.1 Initial Provisioning and Spare Parts**

The Contractor submitted and approved Provisioning Parts Breakdown (PPB) and Recommended Spare Parts List (RSPL) will be used by DND to determine the initial buy of spare parts. Further requirements for spare parts will be ordered by DND from the Contractor on an as and when required basis under the ISS contract. There are expected to be minimal spare parts and/or LRUs.

Long Lead Time Items List (LLTIL) items will be identified in the PPB and RSPL. The intent of identifying a LLTIL early in the acquisition contract is to enable DND to procure initial spares at the same time the Contractor places large quantity production buys.

### **10.2 Spare Systems (Log/Op Stock)**

There will be no ADIS held in Op stock. Log stock is anticipated to be held as follows:

- a. 1 ADIS at 7 CFSD;
- b. 2 ADIS at 25 CFSD.

### **10.3 Special Tools and Test Equipment (STTE)**

STTE is defined as any tooling or test equipment that is specific to the system being procured and is not already in service with CAF maintenance organizations. There will be no STTE at operator maintenance and first line maintenance.

It is expected that the BIT is robust enough to fault isolate to the LRU level.

### **10.4. Cataloguing**

DND will ensure that all equipment and spare parts are identified in the Logistical Breakdown Structure (LBS) and PPB, catalogued and supported by Supplementary Provisioning Technical Documentation (SPTD) supplied by the Contractor. For items lacking NATO Stock Numbers (NSN), DND will apply for the NSN.

DND will not catalogue ADIS Shop Replaceable Units (SRUs) as the Contractor will be responsible, under the ISS contract, for all maintenance tasks requiring the replacement/maintenance of SRUs.

## **11. MANPOWER AND PERSONNEL**

No additional maintenance manpower or personnel is expected to support ADIS.

## **12. COMPUTER RESOURCES**

No additional CAF Information Technology (IT) services or equipment is anticipated.

## **13. TECHNICAL PUBLICATIONS**

The Contractor will create Operator and First Line Manuals that may be in Canadian Forces Technical Orders (CFTO) format if there is not extensive rework/reformatting of the supplier off-the-shelf manuals required.

All Contractor supplied manuals will be placed in the CAF publications depot for DND use, only. DND intends to procure any required technical publications to safely operate, maintain and support ADIS throughout its useful life. Bilingual Operator and First Line Maintenance Manuals, as well as User Guides will be supplied with each ADIS and also supplied to all applicable maintenance organizations.

DND will generate a Repair and Scaling Manual (MX) and include it in the next revision of the MX CD distributed across the CAF, if required.

## **14. CONFIGURATION MANAGEMENT**

The Contractor will establish a Configuration Management (CM) program in accordance with recognized standards and practices. Configurable items will be identified and tracked throughout the product life cycle beginning during design and maintained during ISS.

DND will monitor the Contractor's CM activities.

## **15. PACKAGING, MARKING, HANDLING FOR TRANSPORTATION**

### **15.1 Packaging and Transportation**

ADIS will be packaged in a protective hard storage/transport case(s) prior to system delivery.

ADIS being sent for repair will be packaged and transported in its protective hard storage/transport case.

ADIS spare parts will be packaged using the best commercial packaging practices, unless otherwise directed by DND to use military packaging.

### **15.2 Marking**

All items in the ADIS LBS, PPB and RSPL will be clearly marked for identification, storage, and shipment. The Contractor will be responsible to affix marking on all shipped package containers to identify its contents. The Contractor will mark components, subcomponents and spares with applicable NSNs. Markings for items placed into stores and for shipment will be in accordance with D-LM-008-002/SF-001, Specification for Marking for Storage and Shipment. Contractor is to identify heavy loads, all items having a shelf life, and any special storage facilities (e.g. refrigeration, clean room, etc), if required.

### **15.3 Handling**

Other than normal care when handling electro-optical equipment, additional special handling requirements are not anticipated. However, DND expects the Contractor to identify any special handling requirements related to heavy loads, hazardous materials, shelf life, humidity, temperature, etc. and provide the necessary handling instructions.

## **16. TRAINING CONCEPT**

The Contractor will be responsible for providing all training material for the conduct of training as part of the acquisition contract. The Contractor will provide initial cadre and maintainer training to DND. In the development and management of individual training, the Contractor will be required to use Canadian Forces Individual Training and Education System (CFITES) in accordance with A-P9-050-000 series of manuals. Upon training completion, it is expected that DND operators and maintainers are capable of safely operating and maintaining ADIS. For all ADIS training the Contractor will provide all instructional staff, support personnel, Field Service Representative (FSRs), materials and equipment.

Operator and maintainer training will be provided by the Contractor in accordance with the Contractor generated and DND approved training plan. Training will be conducted in either Canadian French or Canadian English on an as required basis.

## **17. HAZARDOUS AND DANGEROUS MATERIALS MANAGEMENT**

Hazardous materials are not expected to be used in ADIS. However, should hazardous materials be used, the Contractor will identify the material and provide Material Safety Data Sheets for each hazardous material identified.

The Contractor will also identify hazardous and dangerous material in their technical publications (e.g. Maintenance Manual, Operator Guide, and training material) and during training. The Contractor will complete an Equipment Environmental Assessment (EEA) consistent with ISO 14001 used to track

hazardous materials – if any– in equipment and the effects of equipment throughout all phases of its life cycle on personnel and environment.

Contaminated items will be managed in accordance with established by DND CBRN decontamination procedures.

**18. DISPOSAL**

The Contractor will supply the EEA documentation and disposal/demilitarization instructions for ADIS.