

## **INDUSTRY CANADA**

**IC 600081**

### **ADVANCE CONTRACT AWARD NOTICE (ACAN)**

An Advance Contract Award Notice (ACAN) allows departments and agencies to post a notice, for no less than fifteen calendar days, indicating to the supplier community that it intends to award a good, service or construction contract to a pre-identified contractor. If no other supplier submits, during the fifteen calendar day posting period, a statement of capabilities that meet the requirements set out in the ACAN, the competitive requirements of the government's contracting policy have been met. Following notification to suppliers not successful in demonstrating that their statement of capabilities meets the requirements set out in the ACAN, the contract may then be awarded using the Treasury Board's electronic bidding authorities.

If other potential suppliers submit statements of capabilities during the fifteen calendar day posting period, and meet the requirements set out in the ACAN, the department or agency must proceed to a full tendering process on either the government's electronic tendering service or through traditional means, in order to award the contract.

### **CONTRACTING OFFICER NAME:**

**Anna MacIntosh**

Contracts and Procurement Officer

**Telephone Number: (613) 941-4966**

**E-mail: [anna.macintosh@ic.gc.ca](mailto:anna.macintosh@ic.gc.ca)**

### **TITLE:**

Calibration and support agreement for the Certification and Engineering Bureau's (CEB) Dasy5 Specific Absorption Rate (SAR) measurement system and associated test/ antenna equipment.

### **BACKGROUND:**

The DASY 5.2 SAR Measurement System (herein known as the DASY SAR System) is used as part of the CEB's ongoing Market Surveillance program/mandate. The SAR system is a unique and specialized Original Equipment Manufacturer(OEM) Schmid & Partner Engineering AG (SPEAG) standardized SAR measurement system requiring a support and calibration contract, covering specific system equipment, components, service, software updates and ISO/IEC 17025 accredited calibration coverage support program to maintain the testing/ data integrity of the DASY SAR system and to ensure the SAR system continues to comply with internationally recognized standards referenced in Industry Canada Radio Standard Specification RSS-102.

The DASY 5 system was originally purchased in FY2006/7 for \$253,636.80 (AMR# 1502456 and DAMIS tracking# 964196) from (SPEAG) and they have been the vendor that has installed all of the hardware and software for the existing IC system since its

inception as well as providing all the technical support and calibration services to maintain the system.

## **REQUIREMENTS/RESULTS:**

The Contractor will provide the necessary technical support and calibration requirements to maintain the integrity of the Specific Absorption Rate (SAR) programs and supporting equipment, as required by the OEM (SPEAG) and Industry Canada CEB Lab.

## **SCOPE OF WORK AND DELIVERABLES:**

### **Scope of Work:**

The Contractor will provide “support and calibration” services for a period of one year commencing from contract award to March 31, 2014 with the option to renew the contract for 5 additional option years.

The work will consist of the following:

#### **1. Support and Maintenance of the DASY SAR System and Components:**

##### **A) Support and Maintenance**

a) Remote support from Zurich: Remote technical support, system troubleshooting and instruction to Customer's personnel are performed during normal business hours (9 a.m. to 6 p.m. Central European Time (CET) on official working days in Zurich, Switzerland) by e-mail, telephone and telefax. The typical initial response time is 24 hours (excluding weekends and holidays). The identification of the problem and the initiation of corrective actions (i.e., solving the problem by remote intervention, identifying defective components that need to be repaired and software bugs that require fixing, etc.) shall be performed within three days on average.

Remote support, software updates, etc. will be kept on file by the Project Authority and our Calibration Lab tracking system; this would include all e-mails, software and firmware updates, etc.

b) Maintenance and repair of SPEAG hardware in Zurich (not including robot or computer): If the contractor's remote support determines it cannot resolve the problem remotely, defective components must be sent to Zurich for immediate repair or replacement at no extra cost.

Defective parts will be repaired or replaced at the discretion of the Contractor. The Contractor also may at its discretion replace any faulty components. Repairs are limited to remedying defects of the material and manufacture which arise despite proper use and maintenance by the Customer. It remains at the Contractor's discretion to replace or update defective parts; however, the Contractor will only replace any parts if it is in possession of the defective parts on an “ad-hoc” basis.

The Project Authority will contact the Contractor, as needed for any active requirements and the Contractor will provide IC with the antenna calibration schedule software, and firmware updates, etc. IC will track and maintain records of all maintenance and repairs on the equipment inventory files and tracking system.

The list of equipment covered under the "support agreement" conditions are noted under the SPEAG "Support and Calibration Agreement, DASY System, appendix "A."

c) Provide Updates of the software versions covered by this Agreement at the Contractor's discretion: For the purpose of this Agreement, Update shall mean a collection of maintenance patches and bug fixes. The Contractor shall be entitled at its discretion to require the Customer to install certain Updates designated by the Contractor.

In the case of Customer specific software problems, the Contractor is committed to performing the following actions:

- i. Temporary correction of the object code (patching);
- ii. Correction and recompilation of the source code and delivery of the revised object code by courier;
- iii. Adaptation of the documentation.

#### B) Additional Services

a) Yearly web training for new and/or updated software, firmware, etc. (webex or similar platforms including video conference techniques) at the Customer's request. The content of such web training will be mutually agreed upon. The Contractor's systems in Zurich will be used as demonstration unit.

Any relevant files and/or downloads are maintained on IC's dedicated DASY5 systems PC and network backups.

b) Regular supply of technical information (application notes, reports etc.) on an "ad-hoc" basis about component performance, new developments and general dosimetry relevant to the operation of the DASY SAR System, and readily available by the Contractor.

c) Notification of revisions, modifications, and new versions of the DASY SAR System as they become available.

#### C) Additional Benefits (price support and savings, as offered by supplier):

a) Grant of a discount of 25% on the price of revisions and modifications of the current version of the DASY System beyond Updates. This discount does neither apply to new DASY items nor to New Versions of the DASY System. For the purposes of this Agreement, New Versions substantially extend the capabilities of the DASY System; they are designated as New Versions at the Contractor's discretion.

b) Grant of a discount of 25% on all prices relating to the standard calibrations and 50% discount on modulation specific calibration prices. This discount is not limited to items listed in the Appendix A and Appendix B but is extended to all DASY items that require

calibration.

c) Discount of 25% on the loan fee for replacement items during calibration, if required.

## 2. Calibration of the DASY SAR Measurement System

A) Calibration of the DASY SAR Measurement System and associated measurement equipment shall be carried out according to the calibration requirements listed in Appendix B (standard calibration) and Appendix C (modulation specific calibration). The specific calibration dates (calibration time slots) are also included to ensure all equipment remains in calibration throughout the duration of the contract.

## 3. Meetings:

The Contractor is based in Zurich, Switzerland. All deliverables and components of this requirement will be monitored and followed-up by CEB SAR technical staff (via remote forms of communication). On-site meetings is not a requirement for this contract.

## 4. Travel:

There is no requirement for travel or living expenses for this contract.

## 5. Client Support:

Industry Canada will provide shipping services & costs for items sent/returned to SPEAG for calibration.

A tracking system for scheduled/completed calibrated inventory, logs for any discussions, etc. will be maintained by IC's SAR Lab group.

## **DELIVERABLES AND TIMELINES:**

The Contractor will provide Industry Canada with:

-All technical support services, including all calibrations listed as part of "Appendix B" and "Appendix C" on DASY SAR System calibration, must be completed on or before March 31, 2014 including all receipts, such as copy of packing slip, copy of calibration certificates, invoice, etc.

-User manuals, "read-me" files, software system "bug" fixes, general software and firmware updates, etc. are received on an "ad-hoc" basis.

- Technical information (application notes, reports etc.) about component performance, new developments and general dosimetry relevant to the operation of the DASY SAR System will be provided to the Project Authority in hard copy, soft copy on file, if provided.

- Notification of revisions, modifications, and new versions of the DASY SAR System as

they become available.

-Upon completion of calibrations, the contractor will provide the Project Authority with a hard copy of the calibration certificate, packing slips and invoices, etc.

The Delivery date schedule for the calibrations are set up and completed for the year in which they are contracted under Appendix B and C.

#### **IDENTIFICATION OF CONTRACTOR:**

##### **SPEAG**

**Schmid & Partner Engineering AG,**

Zeughausstrasse 43,

8004 Zurich, Switzerland

Phone# +41 44 245 9700

Fax# +41 44 245 9779

E-mail: info@speag.com

#### **REASON FOR AWARDING CONTRACT TO THIS CONTRACTOR:**

The supplier (SPEAG Switzerland) is the Original Equipment Manufacturer (OEM) for this equipment. As such, they are the unique providers of calibration and support services for this system at this time. The DASY 5 system in question was originally purchased by the CEB in 2006/ 07 using a competitive process via PWGSC, to be used to audit hand-held and body-worn radio devices to determine compliance with the requirements of Radio Standard Specifications (RSS)-102, Radio Frequency Exposure Compliance of Radiocommunication Apparatus (all frequency bands).

Following the purchase of the equipment, a considerable amount of time, money has been invested by Industry Canada to have the system customized to meet CEB's requirements and continue to comply with internationally recognized standards. SPEAG is the only company to effectively and properly repair and update the various components of SPEAG equipment to maximize testing reliability.

All system support, technical knowledge, software upgrades, compatibility and interoperability requirements must be 100% compatible with our current DASY 5 system. This will remove any relevant risks to the Department's requirement for accuracy and system support integrity in regards to the validity of our test and measurement results.

#### **ESTIMATED COST:**

The estimated value of the initial contract is **\$44,502.50 U.S.**, taxes not applicable, with the work to take place from date of contract award to March 31, 2014 with the option to renew the contract for 5 additional option years.

The estimated cost for each option year for the technical support and calibration services to maintain the integrity of the SAR programs and supporting equipment is as follows:

Fiscal Year 2014-15: \$53,600.00 (U.S. - No HST)  
Fiscal Year 2015-16: \$58,600.00 (U.S. - No HST)  
Fiscal Year 2016-17: \$64,200.00 (U.S. - No HST)  
Fiscal Year 2017-18: \$70,300.00 (U.S. - No HST)  
Fiscal Year 2018-19: \$77,000.00 (U.S. - No HST)

The total estimated amount is \$368,202.50 (U.S. - No HST).

#### **APPLICABLE LIMITED TENDERING REASONS:**

Section 6(d) of the Government Contracts Regulations is being invoked in this procurement as only one person or firm is believed capable of performing the contract.

This requirement is subject to the North American Free Trade Agreement, the World Trade Organization - Agreement on Government Procurement, the Agreement on Internal Trade, the Canada-Chile Free Trade Agreement and the Canada-Peru Free Trade Agreement.

Limited tendering reason under NAFTA, WTO-AGP, AIT, CCFTA and CPFTA :

NAFTA 1016.2 (d)

WTO-AGP XV.1 (d)

(d)for additional deliveries by the original supplier that are intended either as replacement parts or continuing services for existing supplies, services or installations, or as the extension of existing supplies, services or installations, where a change of supplier would compel the contracting authority to procure equipment or services not meeting requirements of interchangeability with existing equipment or services, including software to the extent that the initial contract for the software was covered by the agreements.

AIT 506.12(a)

(a) to ensure compatibility with existing products, to recognize exclusive rights, such as licences, copyright and patent rights, or to maintain specialized products that must be maintained by the manufacturer or its representative.

CCFTA Kbis-09 ©)

©) for additional deliveries by the original supplier that are intended either as replacement parts, extensions, or continuing services for existing equipment, software, services or installations, where a change of supplier would compel the entity to procure goods or services not meeting requirements of interchangeability with existing equipment, software, services, or installations.

CPFTA 1409(b) (ii)

(b) where the goods or services can be supplied only by a particular supplier and no reasonable alternative or substitute goods or services exist for the following reason:

(ii) the protection of patents, copyrights or other exclusive rights.

**OWNERSHIP OF INTELLECTUAL PROPERTY:**

The Supplier (SPEAG) owns the Intellectual Property Rights.

**CLOSING DATE AND TIME FOR WRITTEN SUPPLIER RESPONSES  
CHALLENGING THIS REQUIREMENT IS 2:00 P.M., EASTERN TIME, OCTOBER 17,  
2013.**

You are hereby notified that the government intends to solicit a bid and negotiate with the firm identified above.

If you wish to submit a written response showing that you are capable of meeting this requirement, it must be done not later than the closing date and time. As it is intended to proceed in a timely manner, responses received after the closing date will not be considered. The Crown reserves the right not to open this procurement to competition.

Responses received on or before the closing date will be considered solely for the purpose of deciding whether or not to conduct a competitive procurement. Information provided will be used by the Crown for technical evaluation purposes only and is not to be construed as a competitive solicitation. Your written response must provide sufficient evidence (e.g. specifications, technical data, drawings, or any other proof) that clearly demonstrates that your product or service is capable of fulfilling this requirement.

Suppliers that have submitted a response will be notified in writing of Industry Canada's decision to continue with the non-competitive procurement or to compete the requirement.

Should you have any questions concerning this requirement, contact the contracting officer identified above. The Industry file number, the contracting officer's name and the closing date of the ACAN must appear on the outside of the envelope in block letters or, in the case of a facsimile transmission, on the covering page.

The Crown retains the right to negotiate with suppliers on any procurement. Documents may be submitted in either official language of Canada.

## Appendix A: Annual Support and Maintenance

**Table A, Standard “Support and Maintenance” Requirements**

Item	Basic DASY5 System
	<b>Minimal Configuration</b>
1	Isotropic E-Field Probe EX3DV4, SN: 3888 (delivered Oct 12)
	Data Acquisition Electronics DAE4, SN: 723 (delivered March 07)
	System Validation Dipole D5GHz V2, SN: 1058 (delivered March 07)
	SAM Twin Phantom incl. table V4.0, SN: TP1422 (delivered March 07)
	Mounting Device for Transmitter, (delivered March 07)
	DASYS Measurement Server, SN: 1004 (delivered March 07)
	Optical Transceiver for Surface Detector (delivered March 07)
	Robot Remote Control with Safety Circuitry V3.0 (delivered March 07)
	<b>Additional Items Covered under this Support Agreement</b>
2	Isotropic E-Field Probe EX3DV4, SN: 3528 (delivered March 07)
3	Isotropic E-Field Probe ES3DV3, SN: 3132 (delivered March 07)
4	Data Acquisition Electronics DAE4, SN: 785 (delivered Dec 07)
5	Dipole D450V3 S/N: 1067 (delivered Nov 09)
6	Dipole D750V2 S/N: 1052 (delivered March 12)
7	Dipole D835V2, SN: 4d048 (delivered March 07)
8	Dipole D1750V2 S/N: 1025 (delivered Nov 09)
9	Dipole D1900V2, SN: 5d08 1 (delivered March 07)
10	Dipole D2450V2, SN: 799 (delivered March 07)
11	Dipole D2550V2, SN: 1008 (delivered Aug 12)
12	ELI Phantom SN:1015 (delivered March 07)



## Appendix B: DASY SAR System Standard Calibration Requirements

**Table B, Standard Calibration Requirements**  
**Items listed below include CW calibration that cover the same frequency bands**

Item Number	Description	Calibration Details	CW Calibration Frequencies	Calibration Slot
<b>2013/14 Calibration Time Slot (ending March 31, 2014)</b>				
1	ES3DV3, S/N 3132	Head (Standard)	835MHz and 1900MHz	Completed between issuance of contract and March 31, 2014
2	ES3DV3, S/N 3132	Head and Body Tissue Simulating Liquid	450MHz	Completed between issuance of contract and March 31, 2014
3	ES3DV3, S/N 3132	Head and Body Tissue Simulating Liquid	750MHz	Completed between issuance of contract and March 31, 2014
4	ES3DV3, S/N 3132	Body Tissue Simulating Liquid	835MHz	Completed between issuance of contract and March 31, 2014
5	ES3DV3, S/N 3132	Head and Body Tissue Simulating Liquid	1750MHz	Completed between issuance of contract and March 31, 2014
6	ES3DV3, S/N 3132	Body Tissue Simulating Liquid	1900MHz	Completed between issuance of contract and March 31, 2014
7	ES3DV3, S/N 3132	Head and Body Tissue Simulating Liquid	1950MHz	Completed between issuance of contract and March 31, 2014
8	ES3DV3, S/N 3132	Head and Body Tissue Simulating Liquid	2450MHz	Completed between issuance of contract and March 31, 2014
9	ES3DV3, S/N 3132	Head and Body Tissue Simulating Liquid	2550MHz	Completed between issuance of contract and March 31, 2014
27	EX3DV4, S/N 3528	Head (Standard)	5200MHz and 5800MHz	Completed between issuance of contract and March 31, 2014
28	EX3DV4, S/N 3528	Body Tissue Simulating Liquid	5200MHz and 5800MHz	Completed between issuance of contract and March 31, 2014
19	DAE 4, S/N 785			Completed between issuance of contract and March 31, 2014
20	D450V3, S/N 1067	Head and Body Tissue Simulating Liquid	450MHz	Completed between issuance of contract and March 31, 2014
21	D835V2, S/N 4d062	Head and Body Tissue Simulating Liquid	835MHz	Completed between issuance of contract and March 31, 2014
22	D1750V2, S/N 1025	Head and Body Tissue Simulating Liquid	1750MHz	Completed between issuance of contract and March 31, 2014
23	D1900V2, S/N 4d094	Head and Body Tissue Simulating Liquid	1900MHz	Completed between issuance of contract and March 31, 2014
24	D2450V2, S/N 799	Head and Body Tissue Simulating Liquid	2450MHz	Completed between issuance of contract and March 31, 2014
25	D2550V2, S/N 1008	Head and Body Tissue Simulating Liquid	2550MHz	Completed between issuance of contract and March 31, 2014
26	Agilent 85070E Dielectric Probe Kit, S/N MY44300117	SAR Liquid Package	20MHz to 6GHz	Completed between issuance of contract and March 31, 2014

**2013/14 Calibration Time Slot (ending March 31, 2014)**

10	EX3DV4, S/N 3888	Head (Standard)	5200MHz and 5800MHz	Completed between issuance of contract and March 31, 2014
	EX3DV4, S/N 3888	Body Tissue Simulating Liquid	5200MHz and 5800MHz	Completed between issuance of contract and March 31, 2014
12	EX3DV4, S/N 3888	Head and Body Tissue Simulating Liquid	450MHz	Completed between issuance of contract and March 31, 2014
13	EX3DV4, S/N 3888	Head and Body Tissue Simulating Liquid	750MHz	Completed between issuance of contract and March 31, 2014
14	EX3DV4, S/N 3888	Head and Body Tissue Simulating Liquid	835MHz	Completed between issuance of contract and March 31, 2014
15	EX3DV4, S/N 3888	Head and Body Tissue Simulating Liquid	1750MHz	Completed between issuance of contract and March 31, 2014
16	EX3DV4, S/N 3888	Head and Body Tissue Simulating Liquid	1900MHz	Completed between issuance of contract and March 31, 2014
17	EX3DV4, S/N 3888	Head and Body Tissue Simulating Liquid	2450MHz	Completed between issuance of contract and March 31, 2014
18	EX3DV4, S/N 3888	Head and Body Tissue Simulating Liquid	2550MHz	Completed between issuance of contract and March 31, 2014
29	DAE 4, S/N 723			Completed between issuance of contract and March 31, 2014
30	D750V3, S/N 1053	Head and Body Tissue Simulating Liquid	750MHz	Completed between issuance of contract and March 31, 2014
31	D835V2, S/N 4d048	Head and Body Tissue Simulating Liquid	835MHz	Completed between issuance of contract and March 31, 2014
32	D1900V2, S/N 4d081	Head and Body Tissue Simulating Liquid	1900MHz	Completed between issuance of contract and March 31, 2014
33	D2450V2, S/N 906	Head and Body Tissue Simulating Liquid	2450MHz	Completed between issuance of contract and March.31.2014
34	D5GHzV2, S/N 1058	Head and Body Tissue Simulating Liquid	5200MHz and 5800MHz	Completed between issuance of contract and March 31, 2014

## Appendix C: DASY SAR System Modulation Specific Calibration Requirements

The calibrations herein are to be performed for the following frequency ranges, as applicable:

**Table C, Applicable Frequency Ranges**

Technology	Frequency Range
WWAN	698-716MHz
	777-787MHz
	788-798MHz
	704-716MHz
	824-848MHz
	1710-1755MHz
	1850-1910MHz
WLAN	2500-2570MHz
	2400-2485MHz
	5030.0-5825.0 MHz
WWAN technologies Include GSM, GPRS, UMTS-FDD, CDMA2000, LTE-FDD WLAN technologies include IEEE 802.11a, b, g, and n	

**Table D, EX3DV4, S/N: 3888 Modulation Specific Calibration Requirements**

<b>E-Field Probe Model: EX3DV4</b>
<b>Serial number: 3888</b>
<b>Calibration Slot:</b> Completed between issuance of contract and March 31, 2014
<b>Note: Coloured fields are for bundled calibrations</b>
<b>GSM-FDD</b>
GSM-FDD (TDMA, GMSK), UID 10021
GPRS-FDD (TDMA, GMSK, TN 0), UID 10023
GPRS-FDD (TDMA, GMSK, TN 0-1), UID 10024
GPRS-FDD (TDMA, GMSK, TN 0-1-2), UID 10027
GPRS-FDD (TDMA, GMSK, TN 0-1-2-3), UID 10028
<b>CDMA/UMTS</b>
UMTS-FDD (WCDMA), UID 10011
UMTS-FDD (HSDPA), UID 10097
UMTS-FDD (HSUPA), UID 10098
UMTS-FDD (HSPA+), UID 10225
CDMA2000 (1xRTT, RC3), UID 10081
<b>IEEE 802.11</b>
IEEE 802.11b WiFi 2.4 GHz (DSSS, 1Mbps), UID 10012
IEEE 802.11b WiFi 2.4 GHz (DSSS, 2Mbps), UID 10059
IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 6Mbps), UID 10013
IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9Mbps), UID 10071
IEEE 802.11n (HT Greenfield, 6.5Mbps, BPSK), UID 10193
IEEE 802.11n (HT Greenfield, 39Mbps, 16-QAM), UID 10194
IEEE 802.11n (HT Greenfield, 65Mbps, 64-QAM), UID 10195
IEEE 802.11n (HT Mixed, 6.5Mbps, BPSK), UID 10196
IEEE 802.11n (HT Mixed, 39Mbps, 16-QAM), UID 10197
IEEE 802.11n (HT Mixed, 65Mbps, 64-QAM), UID 10198

IEEE 802.11n (HT Mixed, 7.2Mbps, BPSK), UID 10219
IEEE 802.11n (HT Mixed, 43.3Mbps, 16-QAM), UID 10220

**Table D continued**

IEEE 802.11n (HT Mixed, 72.2Mbps, 64-QAM), UID 10221
IEEE 802.11n (HT Greenfield, 13.5Mbps, BPSK), UID 10114
IEEE 802.11n (HT Greenfield, 135Mbps, 64-QAM), UID 10116
IEEE 802.11n (HT Mixed, 13.5Mbps, BPSK), UID 10117
IEEE 802.11n (HT Mixed, 135Mbps, 64-QAM), UID 10119
IEEE 802.11n (HT Mixed, 15Mbps, BPSK), UID 10222
IEEE 802.11n (HT Mixed, 150Mbps, 64-QAM), UID 10224
IEEE 802.11a/h WiFi 5 GHz (OFDM, 6Mbps), UID 10062
IEEE 802.11a/h WiFi 5 GHz (OFDM, 9Mbps), UID 10063
<b>LTE-FDD QPSK</b>
LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK), UID 10169
LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK), UID 10181
LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK), UID 10175
LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK), UID 10177
LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK), UID 10184
LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK), UID 10187
LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK), UID 10166
LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK), UID 10148
LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK), UID 10108
LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK), UID 10160
LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK), UID 10154
LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK), UID 10110
LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK), UID 10156
LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK), UID 10163
LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK), UID 10142
LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK), UID 10145
LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK), UID 10100
LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK), UID 10139
<b>LTE-FDD 16-QAM and 64-QAM</b>
LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM), UID 10170
LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM), UID 10182
LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM), UID 10176
LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM), UID 10178
LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM), UID 10185
LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM), UID 10188
LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM), UID 10179
LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM), UID 10180
LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM), UID 10149
LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM), UID 10150
LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM), UID 10109
LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM), UID 10112
LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM), UID 10161
LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM), UID 10155
LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM), UID 10162
LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM), UID 10158

LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM), UID 10111
LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM), UID 10113
LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM), UID 10157
LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM), UID 10164

**Table D continued**

LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM), UID 10159
LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM), UID 10165
LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM), UID 10146
LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM), UID 10147
LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM), UID 10167
LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM), UID 10101
LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM), UID 10102
LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM), UID 10140
LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM), UID 10141
LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM), UID 10143
LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM), UID 10171
LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM), UID 10183
LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM), UID 10186
LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM), UID 10189
LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM), UID 10168
LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM), UID 10144

**Table E, ES3DV3, S/N: 3132 Modulation Specific Calibration Requirements**

<b>E-Field Probe Model: ES3DV3</b>
<b>Serial number: 3132</b>
<b>Calibration Slot:</b> Completed between issuance of contract and March 31, 2014
<b>Note: Coloured fields are for bundled calibrations</b>
<b>GSM-FDD</b>
GSM-FDD (TDMA, GMSK), UID 10021
GPRS-FDD (TDMA, GMSK, TN 0), UID 10023
GPRS-FDD (TDMA, GMSK, TN 0-1), UID 10024
GPRS-FDD (TDMA, GMSK, TN 0-1-2), UID 10027
GPRS-FDD (TDMA, GMSK, TN 0-1-2-3), UID 10028
<b>CDMA/UMTS</b>
UMTS-FDD (WCDMA), UID 10011
UMTS-FDD (HSDPA), UID 10097
UMTS-FDD (HSUPA), UID 10098
UMTS-FDD (HSPA+), UID 10225
CDMA2000 (1xRTT, RC3), UID 10081
<b>IEEE 802.11</b>
IEEE 802.11b WiFi 2.4 GHz (DSSS, 1Mbps), UID 10012
IEEE 802.11b WiFi 2.4 GHz (DSSS, 2Mbps), UID 10059
IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 6Mbps), UID 10013
IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9Mbps), UID 10071
IEEE 802.11n (HT Greenfield, 6.5Mbps, BPSK), UID 10193
IEEE 802.11n (HT Greenfield, 39Mbps, 16-QAM), UID 10194
IEEE 802.11n (HT Greenfield, 65Mbps, 64-QAM), UID 10195
IEEE 802.11n (HT Mixed, 6.5Mbps, BPSK), UID 10196
IEEE 802.11n (HT Mixed, 39Mbps, 16-QAM), UID 10197
IEEE 802.11n (HT Mixed, 65Mbps, 64-QAM), UID 10198
IEEE 802.11n (HT Mixed, 7.2Mbps, BPSK), UID 10219
IEEE 802.11n (HT Mixed, 43.3Mbps, 16-QAM), UID 10220
IEEE 802.11n (HT Mixed, 72.2Mbps, 64-QAM), UID 10221
<b>LTE-FDD QPSK</b>
LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK), UID 10169
LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK), UID 10181
LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK), UID 10175
LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK), UID 10177
LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK), UID 10184
LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK), UID 10187
LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK), UID 10166
LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK), UID 10148
LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK), UID 10108
LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK), UID 10160
LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK), UID 10154
LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK), UID 10110
LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK), UID 10156

LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK), UID 10163

**Table E continued**

LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK), UID 10142
LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK), UID 10145
LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK), UID 10100
LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK), UID 10139
<b>LTE-FDD 16-QAM and 64-QAM</b>
LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM), UID 10170
LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM), UID 10182
LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM), UID 10176
LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM), UID 10178
LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM), UID 10185
LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM), UID 10188
LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM), UID 10179
LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM), UID 10180
LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM), UID 10149
LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM), UID 10150
LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM), UID 10109
LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM), UID 10112
LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM), UID 10161
LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM), UID 10155
LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM), UID 10162
LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM), UID 10158
LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM), UID 10111
LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM), UID 10113
LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM), UID 10157
LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM), UID 10164
LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM), UID 10159
LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM), UID 10165
LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM), UID 10146
LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM), UID 10147
LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM), UID 10167
LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM), UID 10101
LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM), UID 10102
LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM), UID 10140
LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM), UID 10141
LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM), UID 10143
LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM), UID 10171
LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM), UID 10183
LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM), UID 10186
LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM), UID 10189
LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM), UID 10168
LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM), UID 10144

**Table F, EX3DV4, S/N: 3528 Modulation Specific Calibration Requirements**

<b>E-Field Probe Model: EX3DV4</b>
<b>Serial number: 3528</b>
<b>Calibration Slot:</b> Completed between issuance of contract and March 31, 2014
<b>Note: Coloured fields are for bundled calibrations</b>
<b>IEEE 802.11</b>
IEEE 802.11n (HT Greenfield, 6.5Mbps, BPSK), UID 10193
IEEE 802.11n (HT Greenfield, 39Mbps, 16-QAM), UID 10194
IEEE 802.11n (HT Greenfield, 65Mbps, 64-QAM), UID 10195
IEEE 802.11n (HT Mixed, 6.5Mbps, BPSK), UID 10196
IEEE 802.11n (HT Mixed, 39Mbps, 16-QAM), UID 10197
IEEE 802.11n (HT Mixed, 65Mbps, 64-QAM), UID 10198
IEEE 802.11n (HT Mixed, 7.2Mbps, BPSK), UID 10219
IEEE 802.11n (HT Mixed, 43.3Mbps, 16-QAM), UID 10220
IEEE 802.11n (HT Mixed, 72.2Mbps, 64-QAM), UID 10221
IEEE 802.11n (HT Greenfield, 13.5Mbps, BPSK), UID 10114
IEEE 802.11n (HT Greenfield, 135Mbps, 64-QAM), UID 10116
IEEE 802.11n (HT Mixed, 13.5Mbps, BPSK), UID 10117
IEEE 802.11n (HT Mixed, 135Mbps, 64-QAM), UID 10119
IEEE 802.11n (HT Mixed, 15Mbps, BPSK), UID 10222
IEEE 802.11n (HT Mixed, 150Mbps, 64-QAM), UID 10224
IEEE 802.11a/h WiFi 5 GHz (OFDM, 6Mbps), UID 10062
IEEE 802.11a/h WiFi 5 GHz (OFDM, 9Mbps), UID 10063