Solicitation:	4G LTE Cellular Communications Test Bed for FCC Request With VoLTE/IMS support
Vendor:	Lociva
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Submission Date:	1st Nov 2018

Update for 4G LTE Cellular Communications Test Bed

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Introduction

Established in 2001, Lociva is a private mobile communications technology firm based in Northern Virginia, providing high performance mobile networks based on GSM, CDMA, UMTS and LTE radio access technologies as well as an array of consulting services.

We provide our EdgeCentrix private standalone mobile networks to the following markets

Government/Military
- Public Safety
- Dod/Tactical networks

Law Enforcement
- Managed Access for Prison cell phone suppression
- Handset Monitoring Systems

Test Laboratories
- Cellular network emulation
- Handset testing
- Application testing

Enterprise
- Managed Access
- Network operation coverage extension

Customers include the following organizations: US Army, US Navy, US Air Force, CERDEC, SPAWAR (San Diego), SPAWAR (Norfolk), SOCOM, UTB Lab, NSA Mobility Lab, NSA, RCMP, CSEC, CIRTEC, Harris, General Dynamics, BAE Systems, Lockheed Martin, MicroSoft, Amazon and Qualcomm.

LTE Network Core with IMS

We are proposing an evolved Network Core software that has been deployed widely worldwide and supports GSM, UMTS and LTE radio access technologies with VoLTE and CSFB features. Deployed in a Linux environment it provides a flexible basis that allows capacity (number of users, for voice, data, and backhaul), technology (GSM, UMTS and LTE) and feature based licensing to meet the needs of our customers.

As a 4G LTE network core the ECX software provides an MME, PGW, SGW and HSS and IMS (VoLTE) architecture with advances feature options to meet you evolving test needs – these include

- Voice over LTE (VoLTE) – with an embedded IMS core
- Diameter interface – to facilitate roaming to a remote private or MNO HSS
- CSFB to 3G RAN

We were recently in Ireland and are able to confirm the support of VoLTE on this product

4G LTE Radio Access

For 4G LTE we provide a variety of enodeb options based on customers needs. These include enodeb systems from Benetel and Nokia

As a reseller of Benetel radios we can provide custom enodb radion using their 2 x 1W T3K platform in a small private LTE network environment

As a distributor for Nokia Networks we are able to provide 'Tier 1' Carrier Grade enodeb's. As such we can provide the range of Nokia 4G LTE "carrier grade" products which include the following options:

> Flexi Zone Micro Cell LTE enodeb's
> Flexi Zone Pico Cell LTE enodeb's

The Nokia radios support advanced features which include VoLTE and LTE-Advanced – DL Carrier Aggregation. Access to the Nokia Online Support Tools which provides SW downloads, and commissioning support for advance features in included with the Nokia enodeb products

5G Radio Access

We anticipate being able to supply 5G RAN products from Nokia in Q2 2019

Consulting Services

Our specialized consulting projects have included the following:

- Wireless voice and packet data technology, (GSM, MAP/SS7, GPRS/EDGE, CDMA, UMTS, HSDPA, WiMax 802.16d/e, satellite, SIP, T1/E1)
- Wireless data and messaging application integration services
- Security provisioning on wireless networks and devices
- Network design, deployment and optimization
- Customized software and hardware for customer specific functionality/requirements

Contact Details
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Druid Software – Private Cellular Solutions

Druid Software introduction.

Druid Software is a software development company providing cellular mobile core solutions and applications associated with MEC (Mobile Edge Computing) and IoT(5G).

Druid supply 2G/3G/4G core network technology and components to Global System integrators and Network Equipment Providers. In conjunction with tier 1 global partners Druid have provided cellular technology to address segments such as: In-flight cellular services, Port Automation, Off-shore exploration and Critical public services.

Druid have a unique expertise in developing cellular VAS applications targeted at enterprise for deployment in Private or Public cellular networks. These VAS application have particular relevance in vertical segments such as: Public Utilities, Healthcare, Transport, Security and Public Safety/Emergency services.
Druid focus on delivering networks that exceed normal MNO quality of service, reliability and latency metrics. Druid's solutions are ideal for environments where mobile communications are *mission critical*.

Druid's portfolio includes enterprise-scale implementations of all network elements needed to run and operate a 4G/3G/2G Private Cellular Network. Virtual deployments are supported, and the technology can be hosted and delivered as a service.

Druid have recently deployed a maritime IoT application that extends the reach of cellular coverage globally on the "High-Seas". This application provides an IoT container tracking solution to some of the leading shipping companies in the world.

Druid are a privately held company and are headquartered in Dublin, Ireland.

Druid's global integration partners incl: NEC, Mitel Networks, Panasonic System Networks, Ericsson, Panasonic Aviation Corp and Cisco.

Technical overview

Druid's **Enterprise Cellular Network** (ECN) platform is a cellular software application that is specifically developed for Enterprise Mobility, IoT, MEC and Public Safety applications. The solution is an excellent fit for enterprise needs in terms of Functionality, Price, Complexity and TCO. Druid's ECN is a complete solution in that it includes system management, KPI reporting and user provisioning, on a single hardware platform. The solution also provides an API port for integration with third party value added applications.

Platform Components

The Enterprise Cellular Platform encompasses all of the functional elements of a 4G, 3G, 2G mobile cellular core on a single software platform. The Druid ECN application is capable of supporting and managing a combination multiple RAN technologies simultaneously.

KPI & Mgt
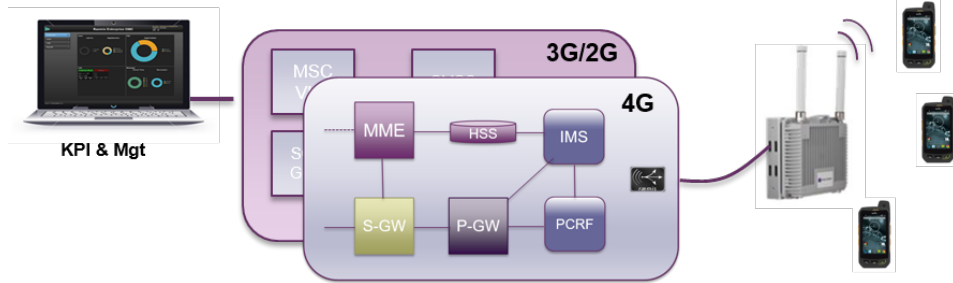
Druid's ECN application supports standard RAN interfaces ABIS, Iuh and S1 for 2G, 3G and 4G radio technologies respectively.

Cellular Core Network elements and reference points.

SOLUTIONS	Enterprise Campus Communications Mobile Extension & VPN	Mobile Edge Computing Mobile Edge Broadband	Internet of Things IoT Reach IoT Service Provider Industrial Campus Automation	Public Safety Public Safety Service Provider Patrol Communications Emergency Network
	RAEMIS ORCHESTRATION AND MANAGEMENT			
	HTTP REST API			

| REFERENCE POINTS | D | C | Iu | Gn | S6a | S5 | S10 | S2a | Cx | Rx | S6d | Gx | SWa |
| | | A | ABIS | Iuh | S2b | Gb | S1 | SWm | S8 | S11 | SGi | Gi | Gy |

| NETWORK ELEMENTS | HLR | G-MSC | MSC | SMSC | GGSN | PCRF | PGW | ePDG | ACS | HSS | I-CSCF | gsmSSF |
| | VLR | BSC | HNBGW | SGSN | RNC | OCS | SGW | P-CSCF | S-CSCF | HeNBGW | gsmSCF |

| STACK | DIAMETER | CAMEL | TCAP | SIGTRAN | TR069 | SIP | ISUP |
| | MAP | M3UA | FAPI | GTP | RTP | IPSec |

| INFRASTRUCTURE | Database | Message bus | Containers |
| | SDN | Linux | Network Function Virtualisation |

Built-in REST API

The Raemis™ platform facilitates exposing the internal state of the platform easily using a HTTP API based on REST principles. This makes Druid solutions very friendly to integration with external enterprise applications and enables a dynamic best-in-class user interface to Druid's solutions.
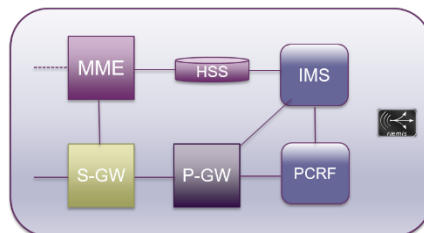
Core Network components

3GPP Core elements	
MCS/VLR	HLR
SGSN/GGSN	SMSC
MME	P-GW
HSS	PCRF
S-GW	IP Multimedia Subsystem
Management and Provisioning	
User provisioning application	Network KPI Dash-board
Performance reports	User CoS (Groups, Mobile extn etc)
QoS reports	Bespoke reports
External Apps interface REST interface	
3rd party applications interface	

Druid's ECN solution - IMS and LTE advanced services

Druid's Enterprise Cellular Solution comprises a complete Evolved Packet Core (EPC) and IP Multimedia Subsystem, IMS. The IMS enables delivery of IP multimedia services such as voice over LTE (VoLTE), dedicated bearer service for improved QoS and other LTE advanced services. Druid's IMS also enables integration with third part IP based enterprise applications allowing for rich value added services to be supported. Druid's open REST interface is the gateway to the core application offering tight integration with such applications.

The internal interfaces comply with 3GPP standard interfaces meaning these components can interoperate with third party EPC/IMS components in MNO networks.
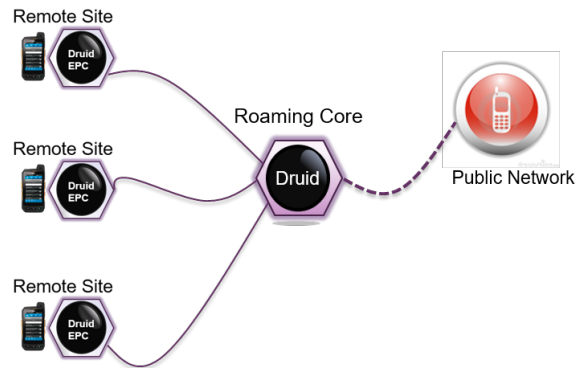
Typical topologies

The following two topology examples server to illustrate how Druid's Enterprise Cellular Network can be deployed**.**

Standalone autonomous network   **Multi-site roaming solution**

Raemis can be configured as a Standalone Private Network providing bespoke mobile services within geographic domain that is defined by a Pico/Femto cell cluster. In this scenario Raemis is providing private mobile network services; voice, data & messaging to a private group of enterprise users within a building or campus.
Usually Raemis is integrated with third enterprise PBX and provides the function of a "Mobile Extension".

In relation to the roaming capability, Raemis supports the required 3GPP interfaces and protocols to support MNO roaming functions.

Commercial off the shelf hardware (COTS) platforms

The application can be installed on enterprise grade server's hardware platforms or hosted in Virtualised environments.

Single Planform – Minimal CAPEX & OPEX

A key attribute of Druid's cellular applications is that all of the functionality necessary to deploy and operate a network is integrated in a single software package, this includes the core application, provisioning system, management and reporting application and an open interface for integration of of third party applications.

The holistic nature of Druid's solution means the total cost of ownership of operation Druids ECN is a fraction of that of all of the Tier 1 Cellular Core providers.

Holistic software package

4G Core Application

Provisioning & Config

Operation & Maintenance

Performance dashboard & Reports

Open interface for 3rd party apps

Self contained complete application

Druid's Enterprise Cellular Solution is a complete 4G core software application hosted on a single industry standard hardware platform.
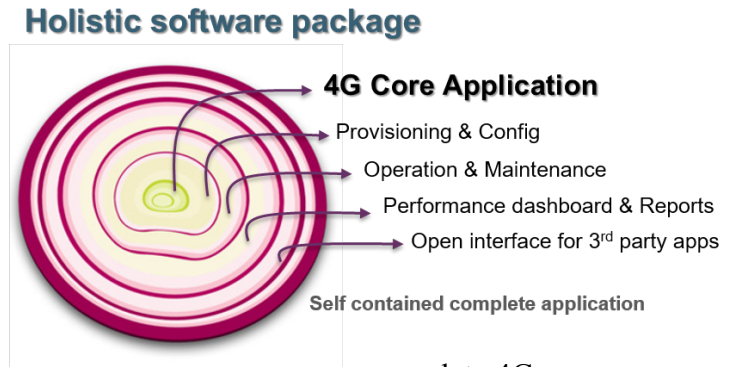
Use cases

**Maritime IoT application.**

The problem:
To provide continuous cellular connectivity & reporting of containers whilst they are on the "High-Sea" where there is no cellular coverage.

The solution:
To deploy an on-board cellular "network slice" to maintain connectivity with the IoT devices (Reefers) using satellite back-haul for signalling & payload.
This solution has been deployed to serve one of the largest global container shipping companies.
The Components of the Maritime IoT application are as follows:

1. **On-board Druid Core Cellular Network Slice : Raemis ECM platform**

2. **On-board Radios: Ericsson 4G & 2G Metro cells**

3. **Satellite modem & service provider**

4. **IoT Global cellular operator**
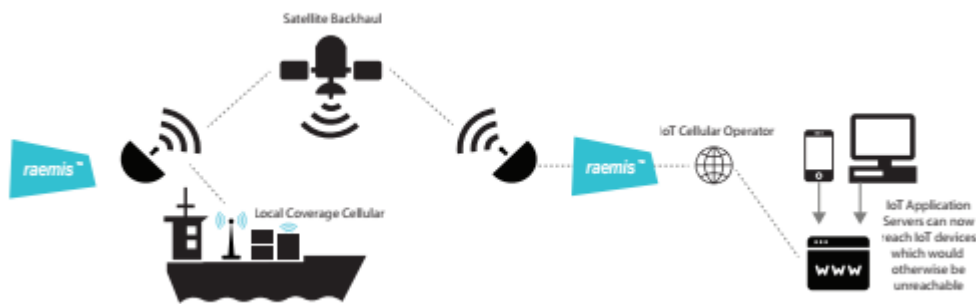
Druid have a range of certified radio (2G/3G/4G) partners including Ericsson, NEC, Airspan, Cisco, IPAccess and Vanu.

Port Automation IIoT application – Rotterdam Port.
The problem:
As the container transportation industry continues to evolve, the need for innovative equipment, technology and practice in terminal operations has become an increasingly important challenge to the port and terminal operating industry.
The Challenge: To provide reliable and robust wireless connectivity to support to support a migration to a **fully-automated and emissions-free, sustainably-powered container terminal.**

The solution:
To deploy private enterprise 4G network provide reliable IIoT broadband connectivity to a host of automated machines and devices such as:
Gantry Cranes, driverless tractor units, stacking cranes and bridge cranes.

The private 4G network is also delivering mobile voice /data applications for port workers

At this time there are **6** port operations companies using Druid's Raemis platform for IIoT purposes in Rotterdam Port.
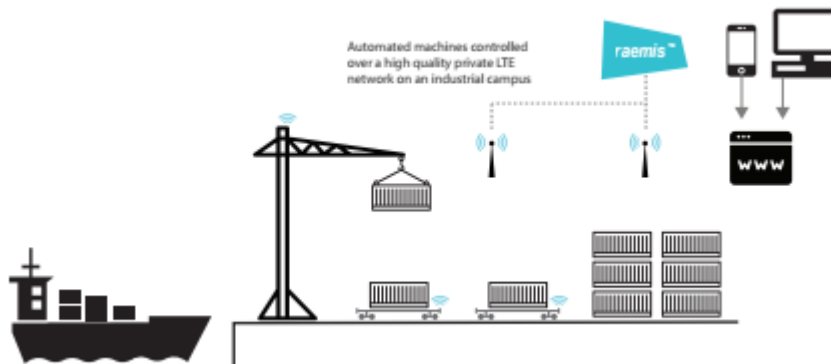
AstaZero Car safety research track (Sweden).
The scenario:

AstaZero in Southern Sweden, is the world's first full-scale test environment for future road safety. Different simulated traffic environments make it possible to test advanced safety systems and their functions for all kinds of traffic and traffic situations. This enables re-search, development and certification of future road safety systems, and functions as an international arena open for vehicle manufacturers, suppliers, legislators, universities and colleges from throughout the world.

The Challenge: To provide reliable and robust IIoT wireless connectivity solution with extremely low latency to operate with vehicles traveling at up to 200KM/H. The network connects automated driverless cars, crash test dummies, navigation systems and traffic control actuators.

The solution:
To deploy private enterprise 4G network provide reliable IIoT broadband connectivity to a host of sensors and actuators providing telemetry on various road test scenarios.

AstaZero's test environments comprise a 5.7 kilometre rural road lane, a City Area with four districts of buildings and streets, a Multilane Road for multi-lane traffic and a High Speed Area for high speed tests

Oil/ Mineral Exploration
The scenario:

One of the largest European based Oil companies have numerous drilling and production platforms in the North Sea.

The Challenge: To provide reliable and robust 4G wireless connectivity solution deployed in one of the harshest environments in the world to deliver mission critical telemetry and personal communications services.

The network delivers the following services
- ❑ Industrial telemetry
- ❑ Weather telemetry
- ❑ Video monitoring
- ❑ Crew Voice services
- ❑ Man-down

The solution:
To deploy a Druid private enterprise 4G network together with Airspan eNodeBs (5W)

North Sea (Europe) Oil/Gas exploration platform

Applications
- ❑ Industrial telemetry
- ❑ Weather telemetry
- ❑ Video monitoring
- ❑ Crew Voice services
- ❑ Man-down

Telemetry   Mandown   PTT   Messaging   Video

Company Background Section

Druid Software are the leading European supplier of Private and Enterprise Cellular networks. Druid with its suppliers have deployed in excess of 2,000 networks worldwide covering the various segments listed below.

Key vertical segments are:

❑ **Public Safety**

Blending the multi-media capabilities of Druid's ECN solution with group PTT capabilities will revolutionise the way security and first responder organisations work. Introducing services such as real-time video and location services coupled with on-line analytics will helps improve communications and shorten incident response time for first responders

In addition, when disaster strikes, because of its portability Druid's ECN solution can be delivered to effected locations and can be carrying cellular traffic within minutes of power-up.

❑ **Energy & Utilities**

Power generation companies, energy and water distribution network entities are classic examples of operations that stand to benefit from the rollout of IoT. Low cost, large scale telemetry and remote control and monitoring will lead widespread automation within these industries delivering improved efficiencies better user experiences.

Druid's ECN delivers dedicated private 4G coverage offering dedicated coverage and extremely low latency for mission critical M2M communications.

❑ **Transportation nodes**

In Airports or Train Stations where public network resources are shared between the general public and operational employees the enterprise is disinclined to commit critical work process & alarm connectivity to the public network. The main fears of the enterprise are congestion, security, resilience and control.

Druid deliver dedicated 4G coverage for the exclusive use of operational staff and their guests that can be managed by the enterprise.

❑ **Campus environments**

With Druid's ECN, environments such as hospitals, universities, commercial ports now have the option to deploy a single wireless network to handle all of their voice, messaging and broadband needs.
Compared to Wifi, private 4G offers a better Quality of Service (QoS), it's more secure and it is specifically designed to deliver mobile services as opposed to wireless services. Druid have already deployed its ECN in vehicle test sites delivering services to vehicles travelling at speeds up to 300Km

❑ **Military**

Key requirements for military applications are portability, ease of use, service availability, robust platforms and secure communications. Druid have combined with custom platform partners to deliver such solutions to government agencies. Druid's ECN application has had very favourable reviews particularly related to its ease of set-up and service availability.

❑ **Remote enterprise**

Druid's ECN solution is ideal for remote enterprise environments such as mining, forestry and energy exploration. Druid's ECN can be quickly deployed to cater for all voice, messaging and data requirements at a remote operation.
In the mining industry high asset value production machines need constant real-time monitoring and control. Druid's ECN is designed to cater for 10s of thousands of M2M applications monitoring & reporting on the condition of critical production assets. Druid's ECN offers local data break-out and local switching of local applications thus optimising expensive satellite backhaul resources.

3GPP Compliance summary

Component	Feature	Description	3GPP Spec ref
Core Network Components	Core network includes	EPC – (Evolved Packet Core) all MME, SGW, PGW, HSS, PCRF.	
Management	EPC Core system operate/configure/ API	via Web based interface, HTTPS	
3GPP compliance associated with the following functions		PCRF, Restoration procedures, handling Subscriber data, NAS, PCC, MM- SGSN, Sh interface, Charging data records, S1 interface, IMS	3GPP TS 23.007, 3GPP TS23.008, 3GPP TS 23.207, 3GPP TS 24.301, 3GPP TS 23.401, 3GPP TS 29.211, 3GPP TS 29.212, 3GPP TS 29.213, 3GPP TS 29.214, 3GPP TS 29.272, 3GPP TS 29.274, 3GPP TS 29.281 3GPP TS 29.329, 3GPP TS 32.240, 3GPP TS 32.251, 3GPP TS 32.299, [TS 32.421], [TS 32.422], [TS 32.423], [TS 33.106], [TS 33.107], [TS 33.108] 3GPP TS 33.401, 3GPP TS 36.412 3GPP TS 36.413
3GPP Diameter support	Authentication, Authorization, and Accounting (AAA) services	Compliancy with 3GPP	IETF RFC 3588, IETF RFC 4005 , 3GPP TS 23.003

TAU Information		Available via API	
HSS	Multiple Operator support	Distributed management/ back-up	
Dist -HSS	Multi-site network	Multi node HSS centrally managed	
UE Location		Available via API	
IPv6		Road-mapped Q1 2019	
Fault reporting		SNMPv2 and SNMPv3 supported	
AKA-based identity verification		supported	
MCPTT		Road-mapped Q1 2019	

Deployment summary

The LTE networks will be embedded in a new state of the art drone with external 0-3dbi omni directional antennas – ir will operate up to 400m subject to FCC approvals in each of the three identified locations

Options are as follows

Enodeb – selection based on available approval to tranmit
        Band 1
        Band 3
        Band 7
        Band 28B

Antennas
0-3dbi omni or circular polarized antennas

Capacity
Benetel – support up to 32 simultaneous voice or data sessions
Nokia – supports up to 400 simultaneous voice or data sessions

Drone
LTE communications will be provided to phones on the ground at these locations with and without roaming services

Lociva Standard Terms & Conditions for Purchase Orders

Whereas, a purchase order (the "PO") has been placed by purchaser, to purchase and license Equipment and Software, as defined above, (collectively, the "Products") and services from Lociva, located at 15330 Riding Club Dr, Haymarket , VA 20169, USA ("LOCIVA"), an authorized agent for ipaccess ltd (IPACCESS) and Zynetix Ltd. (ZYNETIX) manufacturers (MANUFACTURERS) of the Products defined above. The "Agreement" comprises the PO and these PO Terms & Conditions.

1. SCOPE.

In accordance with the PO issued by Purchaser and accepted by LOCIVA, LOCIVA shall: (a) sell, and deliver, as defined in Section 4.1, that Equipment so specified in the PO ("Equipment" being defined as the hardware component of each Product); (b) grant to Purchaser a perpetual, one-time transferable, non-exclusive, paid-up licence to use the Software (as defined in Section 7.1) on the terms and conditions set forth in Section 7; and (c) install and commission the infrastructure Products ("Installation Services") if such service is specified in the PO and provide other services specified in the PO (collectively "Services"). LOCIVA reserves the right to subcontract such portions of Services to qualified subcontractors of LOCIVA's choice as it may reasonable deem appropriate. Purchaser has the right to refuse such subcontractors with reasonable cause. In the case that the Purchaser advises LOCIVA that it wishes to refuse a subcontractor, LOCIVA shall be granted ten (10) working days to effect a remedy.

Acceptance of the PO must occur within five (5) working days after receipt by LOCIVA.

2. POs AND CONTRACT PRICE

2.1 The PO shall define the Products and Services required by Purchaser, the Contract Price, as defined below, and the required Delivery date. The PO shall incorporate these PO Terms & Conditions and no additional or different terms and conditions stated in the PO, any letter, or otherwise shall be binding unless expressly referred and agreed to in writing by LOCIVA and Purchaser. In the event of a conflict between these PO Terms & Conditions and those of the PO, even if the PO does not reference these PO Terms & Conditions, these PO Terms & Conditions shall control.

2.2 The contract price for each item of Equipment, Software or Services is as specified in the accepted PO (the "Contract Price") and shall be paid to LOCIVA in United States' dollars (US$). The Contract Price includes delivery charges in accordance with LOCIVA's delivery obligations set forth in Section 4.1. Unless specifically stated in the accepted PO the Contract Price for Products does not include Installation Services.

2.3 Lociva reserves the right to adjust the Contract Price, as applicable when the validity period indicated on LOCIVA's quotation expires.

2.4 The Contract Price includes applicable purchase taxes or imposts, all of which shall be for Purchaser's account, but Purchaser shall not be required to pay any tax assessed on LOCIVA's income. For the avoidance of doubt, import duties shall be paid by LOCIVA.

3. PAYMENT TERMS.

3.1 Unless otherwise agreed in writing, payment of the Contract Price is due (subject to Section 10.2, without any right of set-off) as follows: 25% of the total Contract Price is due with Purchase Order (PO).

3.2 Purchaser may pay by certified check or transfer funds directly to LOCIVA's bank account.

4. DELIVERY TITLE & RISK.

4.1 All Equipment and Software will be delivered by LOCIVA DDP (Delivery Duty Paid), as defined in Incoterms 2000 ("Delivery").

4.2 Title to the Equipment shall pass to Purchaser on Delivery or Payment in full whichever is the later.

4.3 The Software shall at all times remain the exclusive property of the MANUFACTURER.

4.4 All risk of loss or damage to the Equipment and Software will pass to Purchaser upon Delivery.

4.6 LOCIVA will use reasonable efforts to meet Purchaser's requested delivery dates for Products and Services. LOCIVA may make partial deliveries but this shall not relieve Purchaser of its obligation to accept the remaining items. LOCIVA reserves the right

to refuse, cancel or delay delivery to Purchaser if, after five (5) business days written notice, payment has not been made as required or guaranteed under this Agreement. In any event, LOCIVA shall not be liable for any direct, indirect, consequential, or special losses or damages (including, but not limited to, loss of income or profit and loss of data) that may be suffered by the Purchaser or by any other person for failure to deliver or for any delay or error in delivery of Products or Services for any reason whatsoever.

5. WARRANTY.

5.1 THE WARRANTIES SET FORTH IN THIS SECTIONS 5 ARE IN LIEU OF, AND LOCIVA HEREBY DISCLAIMS, ALL OTHER WARRANTIES AND CONDITIONS, WHETHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED TERMS OF SATISFACTORY QUALITY AND FITNESS FOR A PARTICULAR PURPOSE.

5.2 Subject to Sections 5.3 and 5.4, LOCIVA warrants that the Equipment sold to Purchaser under this Agreement shall, under normal use and service, be free from defects in materials and faulty workmanship, and that the Software licensed to Purchaser under this Agreement shall conform in all material respects to MANUFACTURERS published specifications therefore. The warranty period for any item of Equipment and related Software shall be six (6) months from delivery (the "Warranty Period").

5.3 LOCIVA's obligation and Purchaser's sole remedy under this warranty are limited to the replacement or repair, at LOCIVA's option, of the defective Equipment or Software within the Warranty Period. LOCIVA shall have no obligation to remedy any such defect if it can be shown that: (a) the Equipment or Software was altered, repaired, or reworked by any party other than LOCIVA without LOCIVA's prior written consent; (b) such defects were the result of Purchaser's or a third party's improper storage, mishandling, abuse, or misuse of the Equipment or Software; (c) such defects were the result of Purchaser's or a third party's use of the Equipment or Software in conjunction with equipment electronically or mechanically incompatible or of an inferior quality; or (d) the defect was the result of damage by fire, explosion, power failure, or any act of nature.

5.4 In no event shall LOCIVA be obliged to provide on-site maintenance. Subject to the provisions of this warranty clause, defective parts must be returned within the Warranty Period by Purchaser DDP to LOCIVA's appointed repair facility and said defective parts will be promptly repaired or replaced by LOCIVA at no additional charge to Purchaser. In connection with such return by Purchaser, Purchaser shall comply with LOCIVA's Return Material Authorisation (RMA) procedures. LOCIVA shall deliver the repaired or replacement parts DDP to Customer's designated location. However, if there was no fault found (NFF) in the working condition of the Product, Purchaser shall pay such transportation costs along with LOCIVA's NFF charge of FIVE HUNDRED DOLLARS ($500.00) per item. Risk of loss or damage shall pass to the receiving party on delivery. LOCIVA will charge Purchaser for any maintenance carried out which is not covered by the warranties contained in Section 5.2 or Section 5.5 at LOCIVA's then prevailing standard rates for such Services.

5.5 LOCIVA warrants that the Equipment or Software returned by LOCIVA following repair or replacement by LOCIVA shall be free from defects in materials and faulty workmanship and that the Software will conform in all material respects to LOCIVA's published specifications therefore for ninety (90) days from delivery or until the end of the Warranty Period, whichever is longer.

6. LIMITATION OF LIABILITY.

6.1 WITHOUT PREJUDICE TO SECTION 6.4, NEITHER LOCIVA NOR ANY OF ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, REPRESENTATIVES, SHAREHOLDERS, OR AFFILIATES (LOCIVA AND SUCH OTHER PERSONS, THE "LOCIVA PARTIES"), SHALL HAVE ANY LIABILITY TO PURCHASER FOR LOSS OF PROFITS, INCOME, REVENUE OR DATA, OR INCIDENTAL, CONSEQUENTIAL, INDIRECT OR PUNITIVE DAMAGES OR LOSSES ARISING FROM OR IN CONNECTION WITH THIS AGREEMENT, ANY PO PLACED PURSUANT TO THIS AGREEMENT OR ANY COLLATERAL CONTRACT, OR FROM OR IN CONNECTION WITH THE EQUIPMENT OR THE SOFTWARE OR THE USE THEREOF OR THE INABILITY TO USE THEM EITHER SEPARATELY OR IN COMBINATION WITH OTHER EQUIPMENT OR SOFTWARE, OR FROM OR IN CONNECTION WITH THE SERVICES, OR FROM ANY OTHER CAUSE, WHETHER CAUSED BY NEGLIGENCE, BREACH OF CONTRACT OR OTHERWISE.

6.2 Without prejudice to Sections 6.3 and 6.4, the liability of the LOCIVA Parties, taken as a whole, for each event or series of connected events arising out of or in connection with this Agreement, any PO placed pursuant to this Agreement, or any other collateral contract, or from or in connection with the Equipment or Software or the use thereof, or the inability to use them either separately or in combination with other equipment or software, or from or in connection with the Services, or from any other cause, whether caused by negligence, breach of contract, strict liability, breach of warranty, on grounds of failure of essential purpose, or otherwise, shall in no circumstances exceed one million US dollars (US$1,000,000.00).

6.3 LOCIVA shall be liable for physical damage to Purchaser's property resulting from LOCIVA's negligence up to a maximum aggregate amount of the lesser of three hundred thousand US dollars (US$300,000.00) or the aggregate Contract Price of the Products and Services in the PO.

6.4 Nothing in this Agreement shall exclude or in any way limit LOCIVA liability for death or personal injury caused by its negligence.

7. SOFTWARE LICENCE.

7.1 LOCIVA shall pass on to Purchaser an MANUFACTURER perpetual, nonexclusive, one-time transferable license to use the Software, only with the Equipment purchased under this Agreement. Software licensed under this Agreement is defined as computer programs contained on any media including: (a) hardwired logic instructions which manipulate data in the central processor and which control input-output operations, error diagnostics, and recovery routine; and (b) instruction sequences in machine-readable code which control call processing, peripheral equipment, and administration and maintenance functions as well as associated documentation used to describe, maintain, and use the programs.

7.2 Purchaser shall: (1) not modify, disassemble or decompile any Software, or reverse engineer any portion of the Software or functioning of the MANUFACTURER's Products, or permit others to do so, without LOCIVA's prior written consent; and (2) not reproduce or copy any Software in whole or in part except for backup and archival purposes or as otherwise permitted in writing by LOCIVA. Information to achieve interoperability of the Software with independently created programs, within the meaning of Article 6 of the Directive on the Legal Protection of Computer Programs, is available from LOCIVA on written request.

8. CONFIDENTIALITY.

8.1 All commercial and technical information, documentation, Software and other proprietary information ("Confidential Information") supplied or made available by one party (the "Supplying Party") to the other ("Receiving Party") under this Agreement, except for that which may be in the public domain, shall, as between the parties hereto, be treated as the confidential and proprietary information of the Supplying Party. The Receiving Party, except as specifically authorised in writing by the Supplying Party, shall: (a) not disclose any Confidential Information received from the Supplying Party to any person, except to its employees on a "need-to-know" basis; (b) not reproduce any Confidential Information received from the Supplying Party, in whole or in part; (c) use any Confidential Information received from the Supplying Party only for operation and maintenance of the Equipment; and (d) indemnify the Supplying Party for any loss or damages resulting from a breach of this Section 8.

8.2 If this Agreement is terminated or cancelled, or if the Receiving Party is found to have breached any of the provisions of Sections 7 or 8, Receiving Party shall immediately return all Confidential Information to the Supplying Party. In any event, the obligations of Sections 7 and 8 will survive termination or cancellation of this Agreement.

8.3 Both parties shall not to publish any press releases or otherwise publicise the existence, or any of the terms, of this Agreement without the prior written consent of the other party, which consent may be withheld for any reason.

9. EXCUSABLE DELAY.

LOCIVA shall not suffer any liability for non-performance, defective performance, or late performance under this Agreement due to causes beyond its control and without its fault or negligence such as, but not limited to, acts of God, war (including civil war), civil unrest, acts of government, fire, floods, explosions, epidemics, quarantine, restrictions, or reasonably unforeseeable strikes, lock-outs, plant shutdown or material shortages.

10. TERMINATION.

10.1 LOCIVA shall have the right, prior to payment to LOCIVA of the Contract Price, to suspend its performance under this Agreement by written notice to Purchaser and forthwith remove and take possession of any Equipment and Software which has been delivered if Purchaser shall: (a) become insolvent; (b) have a receiver or manager appointed over the whole or any part of its assets or business; (c) make any composition or arrangement with its creditors; (d) take or suffer any similar action in consequence of debt, or an order or resolution is made for its dissolution or liquidation (other than for the purpose of amalgamation or reconstruction); or (e) if Purchaser attempts to resell the Equipment or Software without the consent of LOCIVA.

10.2 In the event of any material breach of this Agreement by either party which shall continue for thirty (30) or more days after written notice of such breach (including a reasonably detailed statement of the nature of such breach) shall have been given to the breaching party by the aggrieved party, the aggrieved party shall be entitled at its option: (a) to terminate this Agreement; or (b) if the aggrieved party is LOCIVA, to suspend performance of all of its obligations under the Agreement for as long as the breach continues; or (c) if the aggrieved party is the Purchaser, to withhold due payments for as long as the breach continues. Notwithstanding anything to the contrary contained in these Terms and Conditions, Purchaser may terminate this Agreement, notwithstanding Section 9 above, if delivery of Equipment has not fully occurred on or before ninety (90) days from the date of this Agreement.

11. PURCHASER RESPONSIBILITIES.

Purchaser shall: (a) ensure that all LOCIVA-designated personnel have the necessary access to Purchaser's premises and the Products to enable it to provide the Services; (b) provide, at no charge to LOCIVA, reasonable working space and facilities including heat, light, ventilation, electric current and outlets for use by LOCIVA's designated personnel and adequate storage space for equipment and materials; (c) provide any information in a timely fashion which LOCIVA reasonably requests from Purchaser and which is required for LOCIVA to provide the Services or other obligations under or in connection with this Agreement; and (e) not perform, or attempt to perform, or cause to be performed any maintenance or repair to the Equipment, other than pursuant to this Agreement, without LOCIVA's prior, written consent. LOCIVA's personnel will comply with site and security regulations as specified by Purchaser.

12. INDEMNITIES

12.1. Each party (an "Indemnifying Party") covenants and agrees that it will indemnify, defend, protect, and hold harmless the other party and its officers, directors, employees, stockholders, members, managers, agents, representatives, subsidiaries, parents, and affiliates (collectively, the "Indemnified Parties") from and against all obligations, liabilities, fines, damages, losses, costs and other expenses, including, without limitation, any judgments, arbitration awards, amounts paid in settlement, court costs, costs of investigators, fees and expenses of attorneys, accountants, financial advisors and other experts, and other expenses of litigation (collectively, "Damages") incurred as a result of any claims, demands, actions, suits, arbitrations, assessments, adjustments or other proceedings (collectively, "Claims") brought by any third party (including, without limitation, employees of the Indemnifying Party and the Indemnified Parties) arising out of or relating to (a) any breach of representations and warranties of the Indemnifying Party set forth herein; (b) any breach or non-fulfilment of any covenant or obligation on the part of the Indemnifying Party under this Agreement, and (c) any negligent act or intentional misconduct on the part of the Indemnifying Party.

12.2 LOCIVA shall maintain, throughout the term of this Agreement, appropriate insurance policies, including commercial general liability coverage. The commercial liability policy shall include contractual liability. Upon request, LOCIVA shall provide Purchaser with certificates of insurance evidencing LOCIVA's continuing compliance with the preceding sentence. Such policies shall not relieve or limit any of LOCIVA's obligations under this Agreement.

13. MISCELLANEOUS.

13.1 This Agreement shall be construed in accordance with and governed by the laws of the state of Virginia, without regard to its conflicts of law rules. This Agreement is executed in English only, and Purchaser and LOCIVA hereby waive any right which each may have under the laws of any other jurisdiction to have this Agreement executed in any other language.

13.2 All disputes arising out of or in connection with the present contract shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with the said Rules. All arbitration proceedings shall be conducted in English and the location of arbitration proceedings shall occur in Virginia.

13.3 All notices, requests, consents and other communications hereunder must be in writing and will be deemed to have been properly given when actually received by LOCIVA's at its address set forth in the Recitals hereto and by Purchaser at its address in the PO.

13.4 All obligations that by their nature survive the expiration, cancellation or termination of this Agreement shall remain in effect after its expiration, cancellation or termination.

13.5 In the performance of its obligations under this Agreement, LOCIVA and Purchaser shall at all times strictly comply with all export laws, regulations, and orders of the United States of America. Purchaser specifically acknowledges that Equipment, Software or technology supplied or licensed by LOCIVA under this Agreement are also subject to U.K. trade sanctions and export control laws and regulations.