AMENDED AND RESTATED MASTER SERVICES AGREEMENT

SCHEDULE I

DESIGN, IMPLEMENTATION AND OPERATIONAL REQUIREMENTS

This note summarises the principal duties and obligations of the Registrar concerning the setting up and running of the International Registry.

1. The International Registry ("Registry") will facilitate the registration of, and searches against, international (security) interests, such as leases or asset pledges in relation to railway rolling stock as well as prospective international interests[1]. It will design and implement the necessary electronic forms to collect the correct information for registration of international interests (and of prospective and fractional interests)[2] and assignments, subordinations, and subrogation thereof as well as searches against those interests. Similar facilities will be needed for the registration of, and search against, a notice of sale of individual items of railway rolling stock. Registrations of international interests entered into the International Registry data base must be searchable in chronological order of receipt, with the file recording the date and time of receipt. The Registry will also need to have a mechanism for notifying parties who have already registered international interests of any subsequent registrations on the same asset, for discharging international interests, registering pre-existing interests[3] and national interests, correcting errors and facilitating user name changes.

2. Critically, the Registry will be able to register an international interest against a group of assets (for example, 1,000 wagons) with each asset having its own unique identification (URVIS[4]) number and allow searches against such groups, which would be separately identified with a special file number established by the Registry or the user. The Registry will provide for agreed (between the creditor and debtor) substitutions or modifications of the asset group.

3. A special process is required to register non-consensual rights and interests under Article 40 of the Convention, requiring the asset(s) concerned to be marked with URVIS numbering and to block, as far as reasonably determined, abuse.

4. Both the registrations and searches will be conducted seamlessly through the internet 24/7/365. Registrations and searches will be conducted through an online portal as well as mobile applications. The Registry and all data will be hosted in the cloud at data centres maintained and operated within the European Union under a separate contract with Microsoft Azure, AWS or another globally recognised and credible cloud service provider (the "Cloud Provider") and the data should be backed up in a different location (or region) separate to the source region for business continuity or disaster recovery. The Supervisory Authority will be notified as to the name of the Cloud Provider and be provided with a copy of the contract with the Cloud Provider, subject to the redaction of confidential and/or commercially sensitive terms. Additional functionality should be contemplated as the Registry evolves, for

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[1] And searches against creditors and debtors but only with their consent.
[2] As required under section 5.3 of the Regulations. It will be important to include in the online form for registration the jurisdiction in which the debtor is located. This can, for example, be done by a drop-down menu. If the registration is by reference to the URVIS number, the form will need to include a provision whereby the registering party will confirm compliance with the UN ECE Model Rules on the Permanent Identification of Railway Rolling Stock
[3] See Article 60 of the Convention as potentially modified by a declaration made pursuant to Article 60(3) as revised by Article XXVI of the Protocol.
[4] See below.

example, registering interests on assets through the use of QR codes or other form of asset authentication or validation codes.

5. The Registry will need to provide priority search certificates showing the interests registered against a specific item of rolling stock either on demand or under a "standing order" system as well informational, contracting state and Registry user entity search certificates on demand, in each case against payment.

6. The Registry will provide a closing facility so that a succession of transactions can be closed and registered sequentially.

7. User access will be through a digitally secure multifactor authentication system with standard two factor (minimum) access system (similar to password and QR access systems used by banks) and not be dependent on pre-authorised computers. The Registry will provide a facility for individuals to create online accounts. Upon initial setup, individuals will be considered "unverified". Unverified users cannot perform registrations, only searches.

8. An individual can verify themselves by providing identifying information to the Registry. Upon verification, the user is considered "verified" and can now perform a registration on their own behalf. A verified user will also be able to designate alternates with full authority to make registrations (but not to appoint alternates) subject to ID verification by the Registrar[5].

9. To operate on behalf of a legal entity, the verified user must submit a request to qualify and set-up such legal entity as a party qualified to make registrations in the Registry. This process must include evidence that the verified user has sufficient privileges to act on behalf of the entity.[6] Once this process is completed, the verified user will be able to perform a registration on behalf of the legal entity. The verified user will also be able to manage access to the legal entity, i.e., add other verified users who can perform transactions on behalf of the legal entity.

10. Verified users will be able to set up their own pre-funded, privileged, direct access accounts with direct secure access to the Registry.

11. The Registrar will prepare official Procedures[7] dealing with the logistics of its services, and terms and conditions for users, to be approved by the Supervisory Authority.

12. The Registry will publish and abide by the fee schedule for its services, as approved by the Supervisory Authority, but may introduce discounts and incentives as long as they are non-discriminatory.

13. The Registrar will set up, manage and maintain a secure (TLS1.2+ and proper SSL certificates and OWASP WCAG 2.1 or later guidelines) user-friendly applications and website available 24/7/365 with SLA as set out in Attachment I to Supervisory Contract using the Registry domain owned and made available by the Supervisory Authority and will upload official and other[8] information to its website as directed by the Supervisory Authority.

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[5] The process will need to provide functionality to access hierarchical user access where a super user can assign different sets of roles to the other users (alternates) working for the super user.
[6] The technical design should include a facility that allows the verified user to set up a group of qualified entities.
[7] As authorised by the Regulations.
[8] For example, declarations of compliance with the Model Rules on marking of rolling stock (and revocation of such declarations) with a link to the UNECE website.

14. The Registry will utilise a third-party PCI[9] compliant secure payment gateway which accepts credit card and other payment types for payment for services. The Registrar must not accept cash payments or payments in cryptocurrencies.

15. The Registry will also create a highly secure data storage system and secure digital access to the Registry for users.

16. The Registry will also facilitate secure direct access to the Registry from other national registries, through which registrations are to be made.

17. The Registry will store and automatically issue unique identification numbers (URVIS) for railway rolling stock and, if requested by a registered user, may also issue such numbers for a class of components[10]. This number will be 16 digits, including a check digit using the Luhn mod 10N algorithm (no leading zero). The Registrar may wish to facilitate requests for customised numbers.

18. The Registry will issue confirmations when relevant data about an entity (e.g. name) changes.

19. The Registry will monitor any glitches its procedures and equipment may produce, correct any resulting errors and issue corresponding notices to affected parties.

20. The Registry will provide some filings or contracts for information purposes, provided that these documents do not affect the rights of any person.

21. The Registry will provide a staffed helpdesk during European office hours, an FAQ page and a help feature on its website, including detailed instruction videos and manuals.

22. The Registry will complete and provide evidence of third-party Registry system testing (including user acceptance, functional, load and security testing), as well as run complete penetration testing by a recognised CREST approved penetration testing organisation in advance of go-live, along with documentation of Registry standards for records, data and operating procedures, which will be reviewed regularly and externally auditable, at the Registrar's cost, based on a schedule agreed with the Supervisory Authority.

23. On the Go-live date, the Registry must be GDPR compliant. Within a reasonable period of time in the context of industry standards and in alignment with the project implementation plan, the Registry will become compliant with ISO 27001 and other ISO and non-ISO standards considered appropriate by independent third party auditors, as agreed upon in advance by the Registrar and Supervisory Authority[11].

24. The Registry must maintain and make available on the Registry website a privacy policy detailing how personal data is collected and processed and for what purpose, as well as establish a system for opting into any website cookies and to deal with subject access requests.

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[9] The Payment Card Industry Data Security Standard.
[10] E.g. wheel sets or brakes.
[11] Names to be agreed in advance; auditor costs are for the Registrar.

25.   The Registry will document a business continuity plan and a disaster recovery plan and will undertake annual business continuity and disaster recovery exercises. This will also be subject to an independent third party audit.

26.   The Registry will be compliant with applicable international sanctions and EU rules on money laundering, bribery and corruption.

27.   The Registry will need to manage and respond to a complaint process.

28.   The Registry must maintain updated registration statistics and shall publish them in an annual report. This report shall be electronically accessible to any person.

29.   Currently, the Registry will operate only in English but there could be the possibility of adding additional languages at a later date.

30.   The Registry will operate under Regulations issued by the legal successor to the Preparatory Commission, the Supervisory Authority, that come into operation on the day the Protocol enters into force in contracting states.

31.   The Registry will issue guidance notes from time to time concerning the implementation of the Regulations and Procedures affecting its operation. It will also need to make electronic copies of all of the aforementioned documents available to the public at no cost.

32.   The Registrar and the Registry may offer ancillary services with the prior written consent of the Supervisory Authority.

33.   The Registrar will maintain a regular dialogue with the Supervisory Authority, acting through the Secretariat (OTIF), and pay the Secretariat its pre-agreed fees.

34.   The first Registrar, Regulis S.A. ("Regulis"), or companies within its group have detailed experience of running asset registries. To that end, Regulis may use proprietary software and/or open access software. It is a clear condition of its retainer that the Registrar holds all data concerning the security interests, the website and the Registry domain on behalf of the Supervisory Authority and may not use such data, website or domain other than for providing the Registry services except where authorised by the Supervisory Authority.

35.   The Registrar will operate the Registry for a minimum term of ten (10) years. There must be a facility to upgrade storage and operational software as is usual in the industry.

All Schedule 1: Statement of Work

36.   1.   Purposedata on the Registry must be kept in a format that allows its unrestricted portability in a readable form using open source or generally available licensed software.

SCHEDULE II

SYSTEM DESIGN DOCUMENT

Intentionally deleted, as replaced by Design, Implementation and Operational Requirements in Schedule I.

SCHEDULE III

PRICING AND PAYMENT

The figures below are provided as an indicative estimation of the set-up and operational costs of the Registrar and ERS. The cost table below is based on the indicative costs provided in the attachment approved as part of the 2014 contract.

It is important to note that these costs are indicative estimates and will be refined and further detailed during design, establishment and development phases. Given that these costs are also based on 2014 estimates, it is anticipated some overall adjustments to account for matters including market adjustments and cost of living increases may be required for certain items (i.e., insurance, salaries).

The purpose of this Schedule is to describe the System and Services provided by SITA to the Registrar which in summary consist of the following:

- software development services based on the International Aircraft Registry application;
- software support services;
- maintenance services;
- hosting services;
- Registry Official services;
- Certificate Authority services; and
- project management services in accordance with the Project Schedule (Schedule 6).

2.   Requirements

2.1   The Registrar's business requirements include the following:

- The System usability will be in line with industry best practice in accordance with an external auditing procedure as carried out in accordance with clause 18 (Technology and Security Assurance). Changes necessary to remain in line with industry best practice will be introduced through the Change Control Procedure in Schedule 5.

- Live operations will begin within twelve (12) months of the Notification to Begin Date as per the Project Plan.

- The requirements defined in the System Design Document Schedule 2, or agreed changes in subsequent versions through the Change Control Procedure in Schedule 5.

- Design, build, commission and operation of the International Registry as specified in System Design Document Schedule 2, or agreed changes in subsequent versions through the Change Control Procedure in Schedule 5.

- 99.6% Service Availability of the System.

- 8am to 6pm, (Irish Business Hours, excluding Irish Public Holidays) technical support of the infrastructure and application available electronically and by telephone.

- Performance – the application must be designed to handle the volume of transactions estimated in the System Design Document.

- Reporting information – Registrar requires access to the raw statistics information to be able to generate reports on a regular or ad hoc basis. Data shall be in a standard format, which can be imported into 3rd party software packages (e.g. in CSV format).

- Project, operational and service management.

2.2   Future Requirements (outside the scope of this MSA):

- Multi-lingual user interface

- Multi-currency

3.   System Overview

3.1   The System is based on the International Aircraft Registry application to provide the functionality described in the Regulations and will include, but will not be limited to, the following:

A high integrity Registration database

1.

2. User Application and Approval functionality

3. Asset Registration functionality

4. Asset searches functionality (informational and priority)

5. Administration User support functionality

6. Resilient architecture hosted at two (2) locations

7. Data synchronisation between the two (2) locations

8. Logs of all transactions

9. Security and access control infrastructure

10. Internet access

Help desk and support infrastructure

11.

12. Payment infrastructure

13. Tax calculator

14. Production of electronic invoices, credit notes etc

15. Certificate Authority capability

16. URVIS identifier system

Multiple registration and search capability for Users

17.

All as specified in detail in the Regulations.

4. **Responsibilities**

4.1 The Services provided under this MSA by SITA to the Registrar include:

- Infrastructure design, procurement, commissioning and testing
- Software design, development, testing and deployment
- Operational
  - Software Support and bug fixing
  - Database administration
  - Security management
  - System Monitoring and management for all physical infrastructure and software components including server operating systems and database management systems
  - Hosting, including equipment refresh after five years
  - Up to date technical Documentation
- Registry User Support
  - Provision of competent and trained registry official staff
  - Provide System functionality support to users on behalf of the Registrar
  - Second line business support
  - Development of user training material
  - Online training sessions
  - User vetting
- Payment gateway system
- Digital Certificate Certification Authority
- Reporting of operational statistics and information
- Facilitation of training
  - Arranging training of Registrar Staff at the International Aircraft Registry

4.2 SITA and the Registrar shall carry out their respective responsibilities as set out below and agreed between the parties in accordance with the Change Control Procedure in Schedule 5.

Establishment

Phase **SITA Responsibilities**
Software Development
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  o The International Aircraft Registry Software will be extended to provide the full functionality in the Functional specification which will be based upon the Regulations Draft First Edition.

    - SITA will develop the functional specification for approval by the Registrar to match the requirements of the Regulations Draft First Edition.

    - SITA will use an iterative development process with the Registrar and Supervisory Authority.

- o The Application Design will be reviewed by an independent qualified engineer or security specialist company from a security perspective with particular emphasis on the secure coding standards used on the components of the system that guarantee data integrity – such as digital signatures and tamper checking etc.

- o A comprehensive test of the Software will be conducted including regular unit and integration tests during development, UAT testing, security review and non functional testing. Reports will be provided at each stage.

- Registry Officials

  - o Selection and hiring of three (3) Registry Officials to a standard similar to the Registry Officials on the International Aircraft Registry.

  - o Training: The outputs will be training course material which will be used by SITA for an initial training course (expected to be 1 day). The material for further internal courses, if required.

- Familiarisation Training

  - o Registry Officials will be provided with initial familiarisation training, prior to Go Live Date, through a secondment, of at least three months, to the International Aircraft Registry (at SITA's expense) where they will be trained in the procedures of the International Aircraft Registry and will work as International Aircraft Registry Officials. Upon completion, the Registry Officials will return to their duties in the International Registry and prepare for Go Live Date.

  - o Subject to the Registrar paying for all necessary Registrar travel and subsistence costs the Registrar Director of Operations will be provided with an opportunity for familiarisation training, including on the duties of a Registry Officials and on the arrangements which Aviareto has in place for the operation of the International Aircraft Registry.

  - o SITA will facilitate familiarisation training for the Registrar with the MD of Aviareto on the governance structures and controls used at Aviareto including arrangements for working with the supervisory authority, the industry through representative and advisory bodies, insurance procurement and compliance controls which the International Aircraft Registry has put in place.

  - o SITA will make the Registry Officials and any other relevant SITA staff available for familiarisation training with the Rail industry and Secretariat on a not to interfere with the Services basis with travel and subsistence paid by the Registrar.

- Infrastructure

  - o Design a suitable platform – providing an equivalent platform to that proposed in the System design document (Schedule 2). Data integrity and security is paramount. The design document will be the property of the Registrar.

- o Procure, install, commission, test and hand over with adequate support documentation and processes the infrastructure i.e. the hardware and 3rd party software and associated warranties on which the International Registry operates and the hosting and support infrastructure for the International Registry

- o PKI – Install PKI gateway software and necessary firewall rules and networking to connect to PKI supplier.

- o Payment gateway – Install payment gateway software and necessary firewall rules and networking to connect to PKI supplier

- Network Operations

  - o Install management systems which can actively manage and monitor all network nodes, servers, firewalls, and other equipment and software

- Data Centre Hosting

  - o Provide a resilient hosted environment for Primary and Disaster Recovery operations.

  - o Adequate physical security

  - o Hands On support

- Operational Service Planning and Preparation

  - o Develop, document, and test documentation which describes how the operational service will be delivered, in conjunction with the Registrar and any hosting sub-contractor

  - o Prepare for operational readiness by training of staff and exercising the plans

- Project Documentation including:

  - o Functional specification using the Contour system
  - o Process Flow Diagrams for the System
  - o Processes, adapted from the International Aircraft Registry ISO 27001 and ISO 9001 systems, suitable for the International Registry at Go Live Date.
  - o International Registry Infrastructure Diagram with description
  - o User Manual
  - o Operations Manual for use by the SITA Hosting and Operation staff (including procedures for incident handling, change management)
  - o System Security Document
  - o Disaster recovery policy and procedure
  - o Test plan
  - o Project Plan and ongoing project reviews from establishment until Go Live Date including Application development, infrastructure procurement and installation, staff preparation etc.

- Customise website appearance under Registrar direction implementing SITA's obligations herein but, subject thereto, following the basic structure of the International Aircraft Registry website with material variations from this specification being subject to the Change Control Procedure in Schedule 5.

- Acceptance testing.

- Commissioning and non functional testing at hosting and back-up locations

Ongoing Operational Phase – SITA Responsibilities

- Data Protection Arrangements

- SITA will comply with its duties under the applicable data protection legislation

- Software Support

  o Second and Third Level software support will be provided from 8am to 6pm, Irish Business Hours, Monday to Friday (excluding Irish Public Holidays) i.e. defect investigation, replication, reporting, recording, fix development, testing and deployment. New releases (which extend the functionality of International Registry) will be dealt with through the Change Control Procedure in Schedule 5.

- Registry Officials Services

  o Registry Officials shall vet, train, and support users of the International Registry web site in accordance with procedures approved by the Registrar. Registry Officials will provide users with telephone assistance to explain how users can use the International Registry, make payment, and efficiently conduct business. Registry Officials will work in teams of two or three. Teams are rostered to cover the main business hours of our worldwide users.

  o Management of Registry Officials by SITA so that Registry Officials can provide support to users during normal Irish business hours. Registry Officials will provide all of the services required under the Regulations and currently practised by the International Aircraft Registry Officials at the Effective Date of this MSA detailed procedures will be agreed with the Registrar in accordance with the Change Control Procedure in Schedule 5.

  o If transaction volumes exceed the capacity of the three (3) Registry Officials, additional Registry Officials will be added through the Change Control Procedure in Schedule 5.

- Infrastructure

  o Hosting in data centre/s in Luxembourg suitable for business critical IT systems.

  o Maintaining and managing the infrastructure including equipment, operating systems and off the shelf software such as Oracle etc.

  o Infrastructure administration and support including

- All hardware and software

- Storage

- Oracle Database

- Network and security equipment

- Patch Management

o Reporting – Comprehensive Monthly Operations Reports (by 20th of following month) supplemented by ad-hoc reports including, *inter alia*, incident reports when requested. The reporting, which will cover all activities under this Agreement including consolidating the reports of subcontractors used by SITA to deliver services under this Agreement, will be as specified by the Registrar. Data and reports required by the Regulations and Procedures (issued pursuant to the Regulations).

o Securing the infrastructure by, *inter alia*, patch management on all devices, monitoring of all equipment for security breaches and facilitating regular and ad-hoc external security reviews.

o Manage PKI gateway and establish processes to manage certificate renewal and support of PKI software and issues. Ensure adequate expertise is available.

o Manage payment gateway and establish processes to support payment gateway software and issues. Ensure adequate expertise is available.

o Project Management of infrastructural changes arising from the above

o Management of a robust change management process which will be agreed between any third party hosting suppliers, SITA and the Registrar

o Update the Infrastructure Design document as changes are made and provide copies to the Registrar.

o In the case Disaster is declared, ensure the timely implementation of the DR plan in conjunction with the Registrar.

o Annual DR testing

- Management

o Report and Billing raw statistic generation

o Provision, configuration and maintenance of a CRM system allowing ROs to handle email or phone queries. The CRM will be fully accessible to the Registrar.

o Provision of a Phone system or service supporting ACD and reporting on call statistics to such as calls received, handled, abandoned, not staffed, abandon times and other basic ACD call statistics.

o Provision of a software requirements gathering system i.e. Contour which will accessible to SITA and the Registrar.

- Technical support for data issues such as when Tamper Check triggers or when registrations are left on the queue unprocessed.

General Registrar Responsibilities

The obligations of the Registrar shall include, but not exclusively, the following:

- Specification of the interface with Registrar accounting system

- Banking arrangements to support payment of fees by end users

- Provision to SITA of the Regulations and Procedures issued pursuant thereto, the Convention and the Protocol and clarification/explanation of these documents where necessary

- Sign off System design specifications using an incremental development methodology

- Define/agree reporting interface requirements

- Provide a single point of contact for project technical and commercial issues

- Sign off any project change orders as required

- Marketing requirements including names and URLs

Agreement of report formats, which shall be fully in place within three (3) months of Go Live Date.

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- The Registrar will provide to SITA summary information on its contract with the Supervisory Authority and where relevant, at the discretion of the Registrar, a copy of that contract to SITA.

- Where possible arrange familiarisation training for the benefit of the Registry Officials with the rail industry and OTIF.

- Review and approval of procedures to be adopted by the Registry Officials for the Registry Official Services

Delivery Plan

- SITA will carry out its obligations in accordance with the Project Schedule in Schedule 6 subject to the following assumptions:
  - the following timescales shall remain:

ID	Name	Costs	Start	Included Items	Finish
1	**Phase**Phase 1 - Finalise Negotiations and Sign	**Costs**	02 June 2014**Included Items**		12 Nov 2014
7	Phase 2 - Drive Initial Ratifications		11 Dec 2014		03 Aug 2015
12	Phase 3 - PreEstablishment and Development ActivitiesCosts of the Registrar	€235,000	13 Nov 2014Legal Expenses, Hiring Costs, Administration and Set-Up		15 Jan 2016
		€435,000	Personnel		
		€155,000	Audit and Professional Services		

Celle eliminate
Celle eliminate

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Annual Registrar Operating Costs (subject to inflation adjustments)	€163,000	Audit, Insurance and Other Services		
	€26,000	Secretariat Charges		
~~23~~	~~Phase 4 -~~ Establishment ~~Phase~~and Development Costs of the Prime Subcontractor	€515,000	~~03 Aug 2015~~Infrastructure, Security and Set-Up	~~18 Jul 2016~~
~~54~~		~~Phase 5 - Live Operational Phase (Go Live Date)~~€565,000	Software Configuration and Development	~~15 Jul 2016~~ ~~21 Jul 2016~~
		€105,000	Software Audit and Testing	
		€100,000	Design, Administrative and Other Expenses	
Annual Operating Costs of Prime Subcontractor (subject to inflation adjustments)		€430,000	Personnel	
		€698,000	Application Maintenance and Support, Hosting, Security, Certificates and Testing	
		€125,000	Insurance, Audit, Facilities and Other Expenses	

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Celle eliminate

- ~~Progress shall be monitored using regular status reports against a Project Schedule in Schedule 6 and progress meetings between Registrar and SITA. The Proposed Schedule assumes:~~
  1. ~~Signature of this MSA by the middle of Dec 2014~~
- ~~Adjustments to these dates will be reflected in the working Project Schedule.~~

Schedule 2: System Design Document

System Design ERS may second its personnel to another part of ISC or to third parties at arm's length. Rates and income therefrom shall be credited against its yearly operating costs.

1. Purpose

The purpose of this Schedule is to describe the indicative design for the System. System must meet the system requirements below. The technical design of the System will be similar or functionally equivalent to the indicative design noted below in paragraph 3 below.

The purpose

The Software will be based upon the functionality of the International Aircraft Registry software at the Notification Date and the Regulations Draft First Edition.

The Software will also include the following features

- Multiple asset registration (with multiple registration file number)
- Multiple asset search facility
- Ability to include running numbers as part of a registration
- Informational searches against running numbers, which returns the URVIS numbers and information similar to that included in the International Aircraft Registry Informational Search.

System Performance Estimates:

The System must be capable of handling the following transaction volumes

1. One hundred (100) simultaneous users logged on at peak and fifty (50) on average
2. Five Thousand (5,000) registrations made per month with a peak of five hundred (500) per day or one (1) per minute.
3. Four Thousand (4,000) search certificates issued per month with a peak of four hundred (400) per day or one (1) per minute.

For the avoidance of doubt, a registration of multiple items is counted as one registration.

2. System requirements

Introduction

The following are the minimum system requirements for the System.

Environment - Telecommunications

The System shall provide:

1. Accessibility using a current standard telecommunications protocol, e.g., Transmission Control Protocol/Internet Protocol (TCP/IP), and the World Wide Web. The protocol defines a common set of rules and signals that enables computers on the network to communicate.
2. Version-level compatibility between the server operating system (OS), the server, Relational Database Management System (RDBMS), and the software.
3. Fault-tolerance, i.e., the ability of a system to respond to an unexpected hardware or software failure. This is subject to the reduced design being proposed to reduce initial costs where resilience of the primary site will rely on the Disaster Recovery site.
4. A web-based system, with multi-tiered architecture, having the flexibility to optimize performance and reduce resource bottlenecks. For example, these components may include:

a. The presentation processing logic layer (the application code that interacts with a device, e.g., end user's terminal).

b. The business processing logic layer (the application code that uses the input data to perform business tasks).

c. The data manipulation logic layer (the application code that manipulates data within the application).

d. The database management system processing layer (the actual processing of the database data that is performed by the Database Management System (DBMS)

Environment – Workstation

1. The System shall provide access to users through common Internet browser products, released within the past two years. The Internet browser must be capable of employing data encryption, with the ability to access an Internet or Intranet web site. This is subject to the system, in this regard, being similar to that in use for the International Aircraft Registry.

2. The System shall be compatible with a workstation or resources found in a typical office automation setting and an upward compatible processor to allow Software to run not only on the computer for which it was designed, but also on newer, larger, and more powerful models without converting the data. This is subject to the System, in this regard, being similar to that in use for the International Aircraft Registry

3. The encryption and user verification systems must permit the registered users to access the International Registry using a hardware-specific digital certificate issued by the International Registry which creates a secure channel to the International Registry.

Database

The System shall provide, subject to the manufacturer limitations, data access methods to ensure adequate system and data availability for system users as follows:

1. Data integrity and processing consistency by defining system level validation rules and business logic at the server database;

2. Capabilities to perform hot backups to ensure high system availability while supporting up-to-the-minute database recovery;

3. Enhanced configuration management support through a centralized implementation of business logic;

4. Flexible access by users needing data access through other commercial-off-the-shelf software packages, e.g., downloads to manipulate data on a spreadsheet;

5. Automated tools to assist in analyzing the data in respect to System performance.

Security

The System's security shall provide:

1. Firewalls to prevent unauthorized access to or from private networks. For greater security, data will be encrypted;

2. The ability to restrict access to the System, or to particular features of the System, to registered users;

3. A feature to logoff registered users because of inactivity;
4. Limitations of access to appropriate System components, i.e., administrative database functions, data entry, views, or reporting of users based on roles, privileges, and access availability.
5. Limitation of access for users to the operating system. Access will be only available through the presentation layer.
6. Software encryption processing that occurs between the client application layer and the software server. All transactions for registration will utilize data encryption while in transmission.
7. An on-line method to create and assign user identifications and passwords.
8. The System shall include automated tools to record pertinent data in respect of the security and to provide assistance in analyzing this data.
9. Physical access security shall be required to the central service site.

Maintenance
The System must be regularly maintained, with maintenance to include, but not be limited to, hardware, software and telecommunication systems. All maintenance problems must be resolved as soon as possible and so as to ensure system availability in accordance with system reliability requirements. If a maintenance problem cannot be resolved immediately, the Registrar must be notified that the problem is being addressed and the approximate time it will take to resolve it.

Connect Times
Connect times should allow for time outs that take account of the fact that the internet connections may function at different speeds in different regions. The System shall provide for Intranet 6 connect times for an entire action regardless of the number of users according to industry best practice as determined in accordance with clause 18 (Technology and Security Assurance).

Application Infrastructure - Data
The data elements to be accommodated and maintained in the database shall include:
1. The information entered by registered users in relation to each transaction on the International Registry;
2. The fee collected for each transaction (the amount of the fee and a brief description of the fee);
3. Date/time stamps, user identifications and details of encrypted access keys; and other information as may be reasonably required pursuant to the Regulations.
4. The system shall provide, where available in the Oracle database system proposed,:
   a. The flexibility to add new data fields to support changes in the System processes and regulatory requirements without excessive data modification.
   b. Unlimited capacity for new data elements in the database.
   c. Configuration management for software releases.

Application infrastructure - Edits

1. The database shall have editing capability to display guidance when incorrect data is entered using list boxes, text boxes, check boxes or other GUI standards, to ensure compliance with Regulations.
2. The System functionality shall ensure no transaction on the System (such as the registration of an International Interest) may be finalised until the fee prescribed by the Regulations has been paid to the International Registry.
3. The System functionality shall validate new data to ensure accuracy and consistency with existing data. For example, inconsistency of new data may prevent its entry into the system, such as inconsistency of assignment information with original interest.

Application infrastructure - Applications

The System shall reliably support On-Line Transaction Processing (OLTP), transaction based access where the computer responds immediately to user requests, including rollbacks and commits, i.e., rollback is the process of restoring protected resources to the state at the last commit point and commit is the process that causes the changes to the protected resources to become permanent. Data entry locking shall occur at the row level (record level) and provide other users and processes read access to "in-transaction" data.

Application infrastructure - Interfaces

The System shall provide the capability for reasonable state-of-the-art interfacing to heterogeneous (unlike) systems and databases including national and regional registries.

Application infrastructure - Reporting

The System shall be capable of generating statistical and ad hoc reports, e.g. statistical reports on peak periods or selected transactions processed in a particular period.

Application infrastructure - Support

As part of the user's logon process, a configuration management function shall be included that allows for automatic distribution of software enhancements from servers to client workstations.

Technology enhancements

Technology enhancements will be implemented, subject to the Change Control process in Schedule 5, in accordance with best industry practice in order for the system to remain current with advancing technology.

3.   **Indicative System Design for International Registry**

The System will be similar to the following indicative design or an appropriate alternative at the time of design:

Data Centre Hosting

The proposed Data Centre

- Two separate data centres in Luxembourg, either geographically separated or in two parts of the same complex but adequately separated to ensure high availability, will provide hosting for the Primary and DR infrastructures, respectively.
- Each data centre will provide a single private rack with 2 kW of electrical power capacity and remote "Hands and Eyes" services.
- The data centre will provide suitable Internet access, providing public IP addresses in each location.
- The two data centres will be connected via a high-speed interconnection with a standard SLA that can support the overall SLA.

**Primary Site Infrastructure**

The proposed Primary site infrastructure is as follows:

- A single Check Point IP295 external firewall managed by a SMART-1 appliance.
- A single Cisco ASA 5510 internal firewall.
- One Sun Fire X2270 M2 Web and one Management server.
- One Sun Fire X4170 M2 Application and one Database server.
- A single Cisco 2911 router to provide secure inter-site connectivity

- Cisco Catalyst 2960 switches at each tier.
- A Quantum Scalar i40 tape library with a single LTO-4 tape drive.
- A Fujitsu ETERNUS DX90 S2 iSCSI disk array with replication option.

The Sun servers will run the Solaris 10 operating environment and Solaris Containers will be used to isolate workloads and minimise software license requirements.

The servers will provide internal resilience features including disk mirroring via Solaris ZFS, redundant NICs via IPMP, and redundant fans and power, where available.

Apache v2.0 (or later) will used for the Web server and Apache Tomcat application server will be used to support the International Registry application.

Oracle Database Standard Edition One has been proposed to support the System database, which provides substantial cost savings over Enterprise Edition. Oracle Standard Edition One is available for servers with up to two processor sockets. Replication of changes to the primary database storage to the second site will be provided by the ETERNUS disk array Advanced Copy Manager's Remote Copy license.
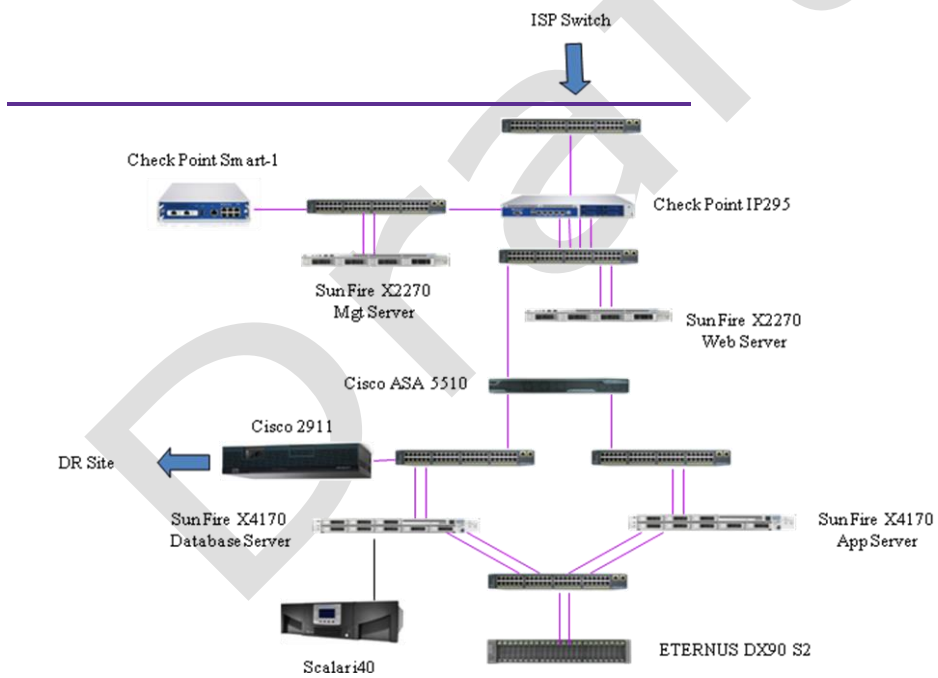
All servers and devices will log to a central Solaris container and Splunk will be employed to search, monitor and analyse log file data. Backups will be performed to the Quantum tape library under the control of NetBackup. All offsite database backups will be encrypted.

DR Site Infrastructure

The proposed DR site infrastructure is as per the Primary site. The DR site will host both Disaster Recovery and Pre-Production environments.

Managed Service Design for the infrastructure hardware and software

A Managed Hosting and Infrastructure Service will be provided to support the International Registry infrastructure from Dublin and includes the following:

- Network Operations Centre – Monday to Friday, 09:00 to 17:30 (excluding Public Holidays)
- Service Desk – Monday to Friday, 08:00 to 18:00 (excluding Public Holidays)
- Service Delivery Management – Monday to Friday, 09:00 to 17:30 (excluding Public Holidays)
- Data Centre Monitoring – Monday to Sunday, 00:00 to 24:00

Availability & Resilience

The dual site design will provide resilience for the service. Should a component at the primary site fail, all traffic can be routed through the secondary site following a manual process. Due to the use of Oracle replication in maximum Protection mode, the database at the secondary site will always be identical to that at the primary site.

Equipment

- Check Point Firewalls – The perimeter firewalls are Check Point IP295 appliances. Tight integration with Check Point management and enforcement points ensures simple deployment.
- Cisco ASA Firewall – The internal firewall is a Cisco ASA 5510 firewall.

Servers

All servers have the following high availability measures:

- Host Network Ports – Each host has dual connections to the core network thus protecting against port failure. In the case of servers connecting to the iSCSI network, there are also dual ports providing this connectivity.
- SAN Network Ports – Hosts that require SAN connectivity have redundant Host Bus Adapters (HBAs) connecting them to the SAN switches providing resilience against a HBA or SAN Switch failure. Path failure is provided by EMC PowerPath.
- Mirrored Disks – All server disks are mirrored so that they can survive a disk failure.
- Multiple Power Supplies – All servers, with the exception of the Sun X2270 web servers, have multiple power supplies so that they can continue to operate in the event of a power supply failure.

Replication

The core component of the System is the underlying Oracle database. Oracle Data Guard is implemented to maintain a standby copy of the primary database in the DR location. Data Guard provides the management, monitoring and automation software to create and maintain one or more synchronised standby databases that protect data from failures, disasters, errors and corruption.

Backup and Recovery
Backup and recovery is provided by NetBackup Enterprise in the DR location, as per production, to facilitate backup of operating system files, application binaries, database binaries and data. The NetBackup domain consists of a single NetBackup master server, which manages the NetBackup catalogue, schedules, policies and media, and two NetBackup media servers, one per location, which write/read data to/from LTO-4 tapes in a local Quantum Scalar i40 tape library.

Schedule 3: Pricing and Payment

1.   Purpose

The purpose of this Schedule is to set out the Charges payable by the Registrar to SITA and rebates credited by SITA to the Registrar.

All pricing in this Schedule is based on the following:

- Unless otherwise stated, all Charges are expressed in Euro

- These are the only charges payable under this MSA, unless agreed and varied in writing.

- The Charges do not include any Taxes, and the Registrar shall pay (or reimburse SITA for the payment of) all Taxes arising in connection with the Services. If a law requires the Registrar to deduct, on account of Taxes, any amount from payment due to SITA under this MSA, then the Registrar agrees that SITA may gross up the amount payable to include such additional amounts as may be necessary, such that SITA receives the amount it would have received had no withholding tax been imposed.

2.   Service Charge

A monthly charge as shown in the table below, commencing on Go Live Date, payable monthly in arrears.

Year	Monthly Amount
Year 1	€115,437
Year 2	€117,169
Year 3	€118,926
Year 4	€120,710
Year 5	€122,521
Year 6	€124,358
Year 7	€126,224
Year 8	€128,117
Year 9	€130,039
Year 10	€131,990

3. Supplemental Charge

The parties have agreed that for certain System functionality and Registry Official Services the Registrar shall pay to SITA a Supplemental Charge.

SITA shall levy the Supplemental Charge on the Registrar for the provision of Identifier Reservation Services and Professional User Account Services and other services as may be agreed between the Parties and approved by the Supervisory Authority from time to time where:

- **Identifier Reservation Services** means a facility to reserve specific unique identifiers for railway rolling stock

- **Professional User Account Services** means a facility for professional users to request authorisation to make registrations on behalf of other parties in the International Registry

- **The Supplemental Charge** means an amount equal to 60% of gross revenues from fees received by the Registrar from users for Identifier Reservation Services, Professional User Account Services and other services as may be agreed between the Parties from time to time and approved by the Supervisory Authority increasing to 92% once the Fee Threshold has been met

4. Variations

The Service Charge or any other charge may only be varied through the Change Control Procedure as set out in schedule 5.

Change Control shall not apply with respect to SITA establishment costs of one million two hundred and forty-one thousand nine hundred and fifty one Euro (€1,241,950) nor shall any financing charges on this amount be allowed.

Schedule 4: Service Level Agreement (SLA)

1.   Purpose

The Purpose of this Schedule is to describe the Service Levels and Key Performance Indicators that apply to the Technology Services.

2. General
2.

If the Service Levels or Key Performance Indicators in this Schedule 4 are not met, the parties will review the resources and operational procedures in use with a view to increasing efficiency or capacity, the latter through the Change Control Procedure in Schedule 5, as necessary.

3. Key Performance Indicators

For the purposesPurposes of the Key Performance Indicators that apply to the Registry Official Services it is assumed that user and transaction volumes can be managed by a fixed resource of three (3) Registry Officials working aan eight (8) hour day each. Where user and transaction volumes rise above those which can be managed by the three (3) Registry Officials, additional Registry Officials will be recruited in accordance with the Change Control Procedure in Schedule 5 and until such Registry Officials are recruited, the Key Performance Indicators for the Registry Official Services shall be suspended. The following are the Key Performance Indicators of the System, and these will be tracked and reported monthly to the Registrar:

- Number of accounts vetted per monthmonths under each category;
- Average time taken to approve or decline an account once all data is received;
- Number of registrations per month, by category;
- Number of searches per month, by category;
- Customer cases opened and closed, average time to close, category of cases;
- Service availability and down timedowntime categorized by planned and unplanned;
- Web Trendstrends data (geographic use of web site)website); and
- Official complaints received.

As experience with the Registry Official Services develops, targets may be agreed between the parties for these Key Performance Indicators.

Initially the only target will be foror Service Availability for which service credits will apply, as described below.

4. Operational Procedures

The flow diagram below provides an indicative illustration of the process flow for supporting customers of the IR.
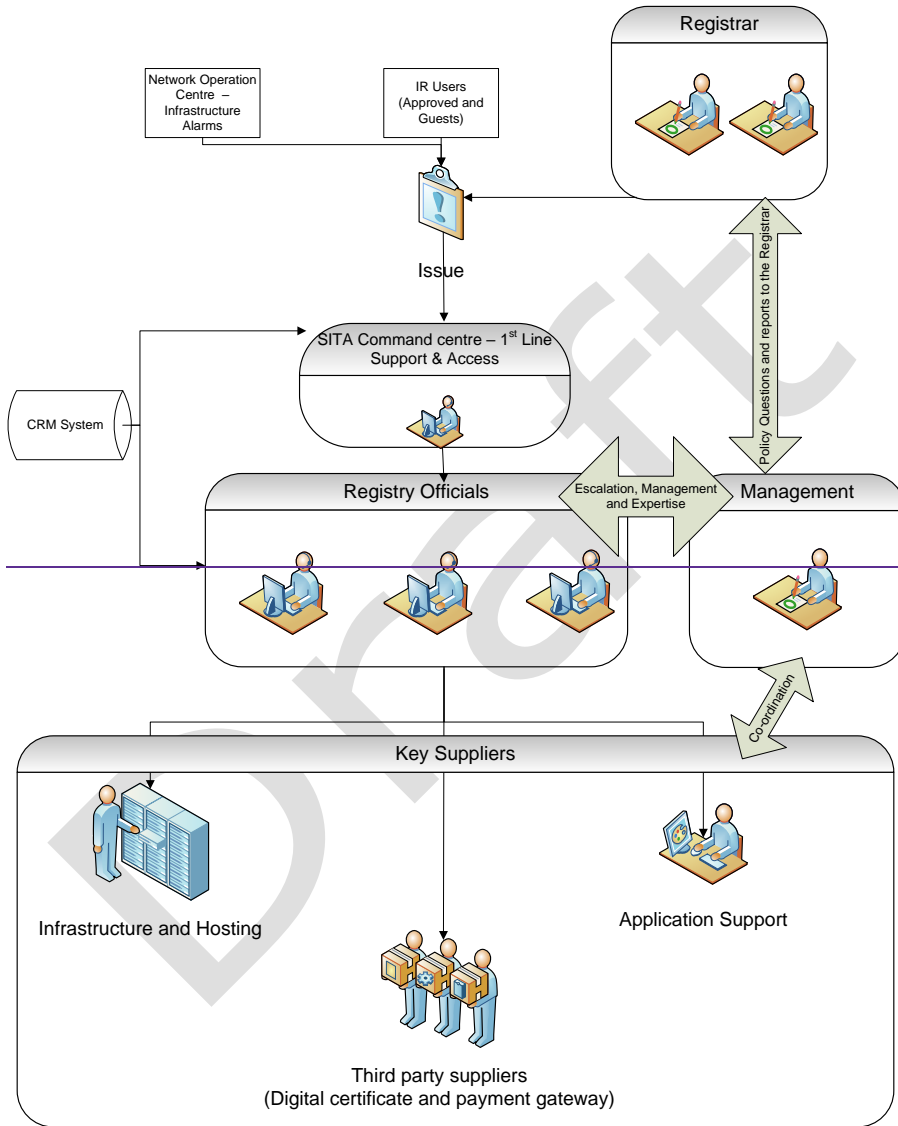
The operational procedures for logging and tracking calls, incidents and issues will be agreed between the parties before the Go Live Date and will be in line with ITIL best practicepractices.

The procedure will cover, at a minimum,:

- Authorized personnel
  - o ~~Personnel~~ Calls can be logged by all users of the system -or by the Registrar or its staff.
- Call ~~Handling, prioritisation~~handling, prioritization, categorization ~~priority~~
  - o Priority 1 calls should be responded to within one (1) hour with a target restore time of four (4) hours.
- Call monitoring
- Status and ~~Escalation Updates~~escalation updates
- Problems not caused by ~~SITA~~ ~~SITA~~ERS
  - o ERS will, within its resources, ~~co-ordinate~~coordinate issues when it is unclear where the problem lies. ~~SITA~~
  - o ERS will manage the relationship with all contractors necessary to operate the service.
- Problems relating to the commercial operation of the International Registry will be handled by the Registry Officials (~~SITA~~ERS staff) but policy issues will be escalated to the Registrar.

5. **Service Levels and Service Credits**

~~SITA~~
ERS shall operate the Technology Services so as to meet the Service Availability Service Level, where Service Availability is defined below, subject to the conditions herein. Contracted Support Hours will be from 08:00 to 18:00 Dublin time Monday to Friday, excluding Irish ~~Public Holidays~~public holidays.

"**Service Availability**" means that the System is operational, fully functional and available to any user (but not including general ~~Internet~~internet access and ~~External Dependencies described in Schedule 1 paragraph 4 , which is~~external dependencies that are outside ~~SITA~~ERS' control) for 99.6% of the time in any calendar month. The 0.4% non-availability does not include planned (e.g. system maintenance) which shall be carried out, outside of normal business hours.

~~SITA~~
ERS shall provide the Technology Services in accordance with the relevant Service Level, standards and procedures, detailed within this Schedule or subsequently agreed between the parties in writing.

In the event that the Technology Services (or an element thereof) do not meet the Service Levels (or any one of them), Service Credits shall be calculated and accrued to Registrar in accordance with this Schedule 4.

Where the Technology Services delivered by ~~SITA~~ERS fail to meet the Service Levels (or any one of them), ~~SITA~~ERS shall (without prejudice to any other right or remedy available to Registrar) ensure that Services are promptly restored to at least the levels defined within the Service Levels.

In the event that ~~SITA~~ERS fails to meet the Service Availability target of 99.6% in any calendar month, Service Credits shall be accumulated in accordance with the following table:

Service Availability in a calendar month	Service Credit Percentage
>= 99.6%	0%
>= 98.6% < 99.6%	1%
>= 97.6% < 98.6%	2%
>= 96.6% < 97.6%	3%
>= 95.6% < 96.6%	4%
>= 94.6% < 95.6%	5%
<>= 94.6%	6%

The percentage shall be a percentage of the recurring Serviceservice monthly Chargecharge as set out in paragraph 2 Schedule 3. For the avoidance of doubt, and as an example, if the availability in a month is 96.8% (and assuming for simplicity that the Serviceservice monthly Chargecharge is EUR50€50,000) the Service Credit would be EUR1€1,500, being 3% of EUR50€50,000.

4.8.2

Service Credits shall be calculated at the end of each calendar month and accrued to the Registrar during the course of each Yearyear. In the second month of the following Year, SITAyear, ERS shall issue a credit note to the Registrar for the total amount of the accrued Service Credit. Registrar shall deduct this amount from sums due to SITAERS. If thisthe Amended and Restated Master Services Agreement (the "Agreement") is terminated for any reason, any accrued Service Credits shall become immediately payable to the Registrar. If this Agreement has reached the end of the Initial Term or an extended term and has not been renewed or further renewed (as appropriate), accrued Service Credits for the final Yearyear (or lesser period, if applicable) shall be paid to the Registrar by SITAERS within sixty (60) days of the end of the Agreement.

If the Service Credit amount exceeds $amounts €20,000 at any time, the Registrar will be entitled, upon making the request in writing, to the deduction of the accrued amount from the next invoice.

Schedule 5: Change Control Procedure

SCHEDULE V

CHANGE CONTROL PROCEDURE

1. Change Order Proforma

Both parties should use the following format if appropriate:

1. 1. Description of ~~Change~~ [   ]change

2. 2. Origin and ~~Reason~~reason for ~~Change~~ [   ]change

3. 3. Reference ~~Documentation~~documentation or regulation [   ]

4. 4. Assumptions ~~& Dependencies~~ [   ]and dependencies

5. 5. Effect of ~~Change~~ [   ]change

6. 6. Details of ~~Change~~ [   ]change

7. 7. If applicable, impact on ~~Project Milestones, Delivery and Acceptance Dates~~project milestones, delivery, and acceptance dates [   ]

8. 8. Implementation costs
    a. ~~Costs~~ Annual [   ]
    b.   One ~~Off~~ [   ]-time

9. 9. Terms ~~& Conditions~~and conditions if varied from ~~the~~ contract [   ]

~~10.   Agreement dated   [   ]~~

10. ~~Signed~~Date of agreement on ~~behalf of SITA   Signed on behalf of~~ change order between ERS and Registrar

_____   _____

11. Signatures of ERS and Registrar on change order

2. Change Order Process

Both parties must adhere to the following:
- • Personnel with the appropriate authority or their nominated delegate may at any time request, and ~~SITA~~ERS may at any time recommend~~,~~ changes or additions to the Software and/or Technology Services.

- A Change Request should be submitted to ~~SITA~~ERS in writing, with the following details:
  - Name and contact details of person requesting the change; and
  - Supporting details relevant to the specific change action using the format above.
- Neither party shall be obliged to agree to any request or recommended change but neither party shall unreasonably withhold its agreement to such request. ~~SITA~~ERS notes that the Registrar may require approval from the Supervisory Authority prior to giving its approval.
- ~~SITA~~ERS shall advise the Registrar of any impact of any requested or recommended change on the price and timescales.
- Until such time as any change is formally agreed, ~~SITA~~ERS shall continue to perform and to be paid for the ~~Service~~Technology Services as if such change had not been requested.
- The parties shall respond in writing to, or shall meet to discuss, the proposed change as soon as practical.
- Any agreement to a requested or recommended change shall become valid as an amendment to the ~~Service~~Technology Services only when recorded in writing and signed by ~~authorised~~authorized representatives of both parties in the ~~Change~~Charge Order format ~~specified in the Agreement~~specific above.

3. Payment

Payment shall be as follows:

~~I.~~(a)   20% of ~~CR payable~~Change Request on order~~.~~
~~II.~~(b)   25% on delivery for acceptance~~.~~
~~III.~~(c)   20% on successful Acceptance Testing~~.~~
~~IV.~~(d)   35% upon release to production

Schedule 6: Project Schedule

1. Purpose

The Purpose of this Schedule is to set out an indicative project implementation schedule. The Project Schedule is divided into two basic parts. Part 1 of the Project Schedule focuses on those activities up to the point where the Software development Service commences. Many of the part 1 activities take place prior to the signature of this MSA however as such activities relate directly to the activities following the signature of this MSA they are therefore reflected below (Part 1). Part 2 of the Project Schedule involves those activities that occur as part of the Software development and operational implementation of the System. Both Part 1 and Part 2 of the Project Schedule include suggested owners for the particular task.

Part One – Pre Software Development Commencement

		Task Name	Duration	Start	Finish	Resource Names
1		Phase 1 - Finalise Negotiations and SIGN	118 days	Mon 6/2/14	Wed 11/12/14	
2		Contract Finalization	4 days	Mon 6/2/14	Thu 6/5/14	SITA,Prep Comm
3		SITA Approval Process	39 days	Fri 6/6/14	Wed 7/30/14	SITA
4		PrepComm Approval Process	81 days	Wed 7/9/14	Wed 10/29/14	Prep Comm
5		Director Rail Co Assigned	0 days	Wed 8/20/14	Wed 8/20/14	SITA
6		Contract Signatures	1 day	Wed 11/12/14	Wed 11/12/14	SITA,Prep Comm
7		Phase 2 - Drive Initial Ratifications	168 days	Thu 12/11/14	Mon 8/3/15	
8		RegCo Agree Ratification Strategy	48 days	Thu 12/11/14	Mon 2/16/15	Regulis,Prep Comm
9		RegCo Attend conferences and meetings to drive ratification	120 days	Tue 2/17/15	Mon 8/3/15	Regulis,Prep Comm
10		Viable Ratifications exist, Target Date Set & Fees Agreed	0 days	Mon 8/3/15	Mon 8/3/15	Regulis,Prep Comm
11		Project Mgr Assigned (part time initially)	0 days	Mon 8/3/15	Mon 8/3/15	SITA
12		Phase 3 - Pre Development Activities	307 days	Thu 11/13/14	Fri 1/15/16	
13		Key Contracts to Draft Stage / Regs&Proc	210.5 days	Thu 11/13/14	Thu 9/3/15	
14		Expose Draft Regulations (Attach II (App 2 - Baseline Regs) to Contract)	21 days	Thu 11/13/14	Thu 12/11/14	Regulis,Prep Comm
15		Set Up Governance Arrangements	22.5 days	Tue 8/4/15	Thu 9/3/15	Prep Comm,Regulis
16		Approve Regulations Draft 1st Edition (v1 for Development)	0 days	Mon 8/3/15	Mon 8/3/15	Prep Comm
17		Official Notification to Begin Development	0 days	Mon 8/3/15	Mon 8/3/15	Prep Comm,Regulis,SITA
18		Investment Phase	119 days	Tue 8/4/15	Fri 1/15/16	
19		Establish SITA Delivery/Development Team	20 days	Tue 8/4/15	Mon 8/31/15	SITA
20		Begin Hiring Registrar Team	45 days	Tue 8/4/15	Mon 10/5/15	Regulis
21		Formalize Key Support Contracts (Hardware, Data Center, Facilities, Certificates, Credit Card processing)	60 days	Tue 8/4/15	Mon 10/26/15	SITA,Regulis
22		Negotiate and Sign Other necessary Contracts	119 days	Tue 8/4/15	Fri 1/15/16	SITA,Regulis

	ⓘ	Task Name	Duration	Start	Finish	Resource Names
23		⊟ **Phase 4 - Establishment Phase**	**250 days?**	**Mon 8/3/15**	**Mon 7/18/16**	
24	🧍	Development Kick Off Meeting	2 days	Tue 8/4/15	Wed 8/5/15	SITA,Regulis
25	🧍	Hire Operations Staff (RO)	59 days	Wed 1/6/16	Mon 3/28/16	SITA
26	🧍	Operations Staff Training (RO)	59 days	Tue 3/8/16	Fri 5/27/16	SITA
27		⊟ **Software Component**	**150 days**	**Tue 8/18/15**	**Mon 3/14/16**	
28	🧍	Requirements Specification Agreed	10 days	Tue 8/18/15	Mon 8/31/15	Regulis,SITA
29	▦	Functionality Review Meeting 1	0 days	Mon 10/26/15	Mon 10/26/15	SITA,Regulis,Prep Comm
30	▦	Functionality Review Meeting 2	0 days	Mon 12/7/15	Mon 12/7/15	SITA,Regulis,Prep Comm
31	▦	Functionality Review Meeting 3	0 days	Mon 2/1/16	Mon 2/1/16	SITA,Regulis,Prep Comm
32	▦	Functionality Review Meeting 4	0 days	Mon 3/14/16	Mon 3/14/16	SITA,Regulis,Prep Comm
33		⊟ **Hardware Components**	**151 days?**	**Tue 9/1/15**	**Tue 3/29/16**	
34	🧍	Hardware Design Confirmed	10 days	Tue 9/1/15	Mon 9/14/15	SITA,Regulis
35	🧍	Hardware Configuration and Test	20 days	Tue 2/2/16	Mon 2/29/16	SITA
36	🧍	Final As-Built System Design documentation	1 day?	Tue 3/29/16	Tue 3/29/16	SITA
37		⊟ **Test and Acceptance**	**63.67 days**	**Mon 4/11/16**	**Fri 7/8/16**	
38	▦	PAT and Acceptance Criteria Submitted to Registrar	0 days	Mon 4/11/16	Mon 4/11/16	SITA,Regulis,Prep Comm
39	▦	Draft User manual provided to Preparatory Commission	0 days	Mon 4/25/16	Mon 4/25/16	SITA,Regulis
40	▦🧍	PAT	3.33 days	Tue 5/31/16	Fri 6/3/16	SITA,Regulis,Prep Comm
41	▦	FAT	3.33 days	Tue 7/5/16	Fri 7/8/16	SITA,Regulis,Prep Comm
42		⊟ **Operations Support Model**	**25 days**	**Thu 4/21/16**	**Thu 5/26/16**	
43	🧍	Operations Services Guide	25 days	Thu 4/21/16	Thu 5/26/16	SITA
44		Operations Support in Place	0 days	Thu 5/26/16	Thu 5/26/16	SITA,Regulis
45		⊟ **Administrative Establishment**	**238 days**	**Mon 8/3/15**	**Thu 6/30/16**	
46	▦	Establish Office (Regulis S.A.)	0 days	Mon 8/3/15	Mon 8/3/15	Regulis
47	▦	OTIF and Unidroit announce appointees to the Supervisory Authority per Article XII of the Luxembourg Protocol	0 days	Fri 4/22/16	Fri 4/22/16	OTIF,UNIDROIT
48	🧍	Establish Office (SITA Ops)	20 days	Wed 2/3/16	Tue 3/1/16	SITA
49	🧍	Initial Procedures Review	20 days	Mon 5/16/16	Fri 6/10/16	SITA,Regulis

	ⓘ	Task Name	Duration	Start	Finish	Resource Names
49	🧍	Initial Procedures Review	20 days	Mon 5/16/16	Fri 6/10/16	SITA,Regulis
50	▦	Final Procedures Review	9 days	Mon 6/20/16	Thu 6/30/16	
51		⊟ **Phase 5 - Regulations - Ready for Go Live**	**250 days?**	**Tue 8/4/15**	**Mon 7/18/16**	
52	▦	Draft Changes to Regulations	15 days	Mon 5/9/16	Fri 5/27/16	Supervisory Authority
53		Regulations will be published for public comment	1 day?	Tue 8/4/15	Tue 8/4/15	
54	▦	Sign Off Regulations First Edition	36 days	Mon 5/30/16	Mon 7/18/16	Supervisory Authority
55		⊟ **Phase 6 - Live Operational Phase (Go Live Date)**	**4 days**	**Fri 7/15/16**	**Thu 7/21/16**	
56	🧍	Agree Procedures	1 day	Fri 7/15/16	Mon 7/18/16	SITA,Regulis
57	🧍	Verify Completion of System Testing (FAT)	1 day	Fri 7/15/16	Mon 7/18/16	SITA,Regulis
58	🧍	Review Pre-Operations Check List	3 days	Mon 7/18/16	Thu 7/21/16	SITA,Regulis
59		Go Live	0 days	Thu 7/21/16	Thu 7/21/16	SITA,Supervisory Authority

Schedule 7: Contract Management Procedures

SCHEDULE VI

PROJECT SCHEDULE

INDICATIVE PROJECT IMPLEMENTATION PLAN

The Project Implementation Plan will be developed in conjunction with key Preparatory Commission stakeholders utilising proven registry and project management methodologies. It will include activities related to key streams including technology, operational preparation, contract and ratification efforts, advancement of regulations and Registrar establishment.

Specific to the registry technology, it is anticipated that implementation will occur over a 9-12 month period, including design and engagement with key stakeholders, and extensive testing. The technology project plan will include three primary phases: definition, implementation and transition. The following table captures key activities anticipated in each of the phases.

Definition (0-3 months)	Implementation (6-9 months)	Transition (0-3 months)
• Stakeholder engagement • User interface/user experience design and workshops • Workflow design and development • Project plan • Project backlog development	• Project backlog refinement • Configuration and development activities • Implementation utilising DevOps • Testing (including automated testing, regression testing, nightly test runs, cyber security testing, accessibility compliance testing and performance testing)	• User acceptance testing • Non-functional testing (including security and penetration testing) • Training and development of online tutorials

The above items are for illustrative purposes only. A completed project implementation plan, as agreed to between the Registrar and the Supervisory Authority, will be provided at a later date.

1 CONTRACT MANAGEMENT ~~SUPPORT CONTACTS~~PROCEDURES

1. ~~SITA~~Management Support Contacts

ERS will provide management support for the Technology Services to the Registrar from a nominated contact point ~~i.e. the General Manager or a nominated Registry Official.~~(the "Contact Person").

The ~~SITA General Manager~~Contact Person will be responsible for ~~co-ordinating~~coordinating technical and operational support for all Technology Services provided to the Registrar, for performance monitoring and reporting, for the project management of any new services or software or hardware required and for the overall management of the Technology Services provided to the Registrar. The ~~General Manager~~Contact Person will also be responsible for commercial matters and the Service Levels.

Within the Registrar, ~~co-ordination~~coordination of the Technology Services will be the responsibility of ~~the Operations Director.~~an operations director or similar position to be communicated to ERS. Contract management and change control authority will be the responsibility of ~~the Registrar Managing Director. They~~a managing director or similar position to be communicated to ERS. These people will provide ~~the~~ primary service management interface with ~~SITA~~ERS.

~~2~~ ~~Service Review Meeting~~**SERVICE REVIEW MEETING**

2.

All the Technology Services will be reviewed at regular ~~Service Review Meetings~~service review meetings attended by nominated personnel from both parties. A service review meeting~~Service Review Meeting~~ will be held on a monthly basis or as otherwise agreed. ~~As a minimum, this meeting will be attended by:~~The Registrar and ERS shall jointly determine who from each party is required to be present at service review meetings.

- ~~SITA personnel: General Manager~~

- ~~Registrar personnel: Operations Director~~

The normal agenda for the ~~Service Review Meeting~~service review meeting will include, but is not limited to:

- Services delivered over the previous period;
- Performance against the Service Levels;
- Exceptions and non-performance against Service Levels;
- Repeat fault diagnosis and remedial action taken; and
- Any other matter deemed necessary to the efficient delivery of the Technology Services.

3.   The yearly Contract Review Meeting

A yearly contract review meeting will be driven by the performance over the previous twelve (12) month period. However, in the first Year a Contract Review Meetingyear, a contract review meeting will take place three (3) months and no later than four (4) months from the date of the successful completion of the Final Acceptance Testing. As a minimum, this meeting will be attended by:The Registrar and ERS shall jointly determine who from each party is required to be present at yearly contract review meetings.

- SITA personnel: General Manager

- Registrar personnel: Managing Director
                               Operations Director

The normal agenda for the Contract Review Meetingcontract review meeting will include, but is not limited to:

- Review of SITA'sERS' performance of the Technology Services (including, without limitation, performance against Service Levels));
- Registrar/SITAERS financial performance;
- Review of the Registrar business case and assumptions;
- Review of the Annual Reportannual report on the operation of the International Registry, prior to its submission to the Supervisory Authority;
- AreasArea of innovation and improvement;
- Outline plans and changes to the Technology Services anticipated in the short to medium term future;
- Health, safety, and compliance issues; and
- Review of the Regulations and Procedures approved pursuant to the Regulations.

4.   Other Ad Hoc/Technical Meetings

Other ad hoc or technical meetings will be arranged, as necessary, between the Registrar and SITAERS.

SCHEDULE VIII

ANCILLARY SERVICES

None