

The International Registry For Aircraft Equipment—The First Seven Years, What We Have Learned*

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Abstract

The International Registry (IR) is a specialized registry for aircraft equipment established by an international treaty. It is global, entirely on-line and notice based. Although it is not for profit and established to improve the efficiency of the global aviation finance industry, Aviareto Limited, a private company in Ireland, under the supervision of a U.N. body,⁴ operates it. It offers valuable lessons and comparisons for other registries and practitioners. The legal and technological principles underpinning it and the nature of the industry it serves have shaped its operations. During its first seven years of operation, it has focused on adhering to international standards and an almost obsessive drive to be guided by the needs of the industry worldwide. The industry's input has

*This paper is not intended and should not be construed as legal advice. It is provided for information purposes only by the authors in their private capacity. The Registrar accepts no liability for the contents of this paper.

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⁴The International Civil Aviation Organisation (ICAO) was appointed as the Supervisory Authority (SA) for the International Registry by a resolution of the diplomatic Conference that established the Cape Town Convention and Aircraft Protocol in 2001.

ensured continuous innovation, allowing the International Registry to serve needs not anticipated by the Treaty⁵ and to align with industry practice, especially at the critical time of a closing. Other key success factors include its good governance and risk management approach to all activities. Operating a global electronic registry requires legal, engineering, diplomatic and administrative skills and a team that sees complex challenges through these various lenses.

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I. History of the Cape Town Convention and Its International Registry for Aircraft Equipment

Asset based financing is popular with Aircraft due to the high value of the asset, its international mobility and standardised designs all leading to easy resale. Prior to the Cape Town Convention, national laws differed greatly in their composition and effectiveness, necessitating complex

⁵The Treaty refers to the Convention on International Interests in Mobile Equipment, signed at Cape Town (South Africa) on November 16, 2001 (the Cape Town Convention) and the Protocol to the Convention on International Interests in Mobile Equipment on Matters specific to Aircraft Equipment, signed at Cape Town (South Africa) on November 16, 2001.

[†]Appendix A, *infra*, lists 20 terms and acronyms used in this article. In addition, for the convenience of reader, acronyms are noted the first time the term is used in the article.

legal structures and practices to provide suitable security for international deals. It had been clear for many years that an international regime in this area would offer many benefits.

On November 16, 2001, a Diplomatic Conference held in Cape Town, South Africa, under the co-sponsorship of the International Civil Aviation Organization (ICAO) and the International Institute for the Unification of Private Law (UNIDROIT), adopted an international treaty, known as the Cape Town Convention and Aircraft Protocol designed to facilitate asset based financing of aircraft equipment.

Two further protocols were adopted at subsequent Diplomatic Conferences i.e. a Rail Protocol and a Space Protocol, although neither has come into force at the time of writing of this article.

ICAO instigated a tendering process to find a company to operate the International Registry. Aviareto Limited, an Irish Company, won that competitive process and established itself in 2004. The International Registry (aircraft) came into effect on March 1, 2006.

II. Introduction

Aviareto Limited, based in Dublin (Ireland), was established for the sole purpose of developing and operating the International Registry for Aircraft Equipment, pursuant to the Cape Town Convention (CTC) and Aircraft Protocol (AP), jointly referred to hereinafter as “the Treaty.”⁶

In March 2006, the IR went into operation with six ratified States and five employees. By September 2013, Aviareto had 13 staff supporting over 50 ratified countries. By that date, over 432,000 Registrations and 500,000 Searches had been performed.

The IR is operated on a not for profit basis and has unlimited liability under the Treaty. The IR has been a success based upon the view of its customers, the high level of ratification by States and the risk profile of the business in the eyes of its insurers.

As well as managing the growth in activity levels, the initial period of operation was an opportunity to learn and to

⁶Convention on International Interests in Mobile Equipment, signed at Cape Town (South Africa) on November 16, 2001 (the Cape Town Convention); Protocol to the Convention on International Interests in Mobile Equipment on Matters specific to Aircraft Equipment, signed at Cape Town (South Africa) on November 16, 2001.

develop insights into the operation of the IR and, more generally, the operation of Electronic Registries. This paper explains how the IR operates but also seeks to share what Aviareto has learned in its role as Registrar.

The IR is an electronic system for recording and hence establishing the priority of financial interests in Aircraft Equipment pursuant to the Treaty. All such registered interests are searchable by the public. The IR is an online, notice-based registry system.⁷ The online and notice-based aspects of the system have been key factors in its success. These factors, while individually important, have combined very effectively and we believe that there is a general lesson in that.

III. Principles of an Electronic Registry

The IR, as an electronic registry, differs substantially from a paper-based registry. Everything on the IR is accomplished electronically; user applications and approvals, registrations, amendments and discharges are consented to electronically, and the electronic record is definitive.

One challenge facing the Registrar, and all electronic registries, is the need to evolve in line with technological advances. The records on the IR must be available in the long term and certainly well beyond the date by which the technology in use today becomes obsolete. The Registrar must ensure that record-keeping methods develop in line with technological advances, ensuring records are maintained and accessible regardless of the technology in use. The records must be written in *electronic stone*.

Electronic registries provide many benefits over paper-based equivalents, primarily, speed, accessibility and anonymous searching. With these benefits come new and varied security risks and regulatory challenges.

Accessibility and Anonymity

The IR provides an unprecedented level of accessibility to the public. Traditional paper-based registries are accessible only at their physical location within their business hours. The IR is available 24 hours a day, seven days a week, to anyone with access to an internet-connected computer. That a person can access the IR remotely at any time is clearly beneficial for users, that they can do so anonymously,

⁷Art. 17(2)(i) CTC.

however, raises concerns for the security of data held on the IR. The IR has two main types of information, *i.e.*, contact information for entities or system users and registration information.

Clearly, making the latter available is the *raison d'être* of the IR. However, due to its electronic nature, a user having access to volumes of registration information could develop market intelligence and other commercial insights. Therefore, controls are necessary. In a paper-based registry, there was a natural control due to the active role of the Registrar. A user would have to convince a Registry Official (RO) to release a large volume of data and would then have to process it manually. With an electronic registry, electronic controls are necessary so users (who are not present and may be unknown to the Registrar) are not permitted to download large volumes of registration data in bulk and must pay for the most detailed information.

However, of most concern from a security point of view is contact information for entities or system users. This information is necessary to allow users to make registrations and generally make use of the system. A paper-based registry had the same natural controls noted above. The problem, for an electronic registry, is more complex.

Without proper controls, such data could be used for illegitimate purposes. A 2010 report by Symantec⁸ states that the price achieved in 2010 for email addresses on the black market ranged from \$1—\$20 per megabyte file. For full identity information, the price ranged from \$0.50—\$20.00 per record. The Registrar has put in place measures to protect the information held on the IR, and has attempted to strike a balance between protecting data and allowing users access to information. The information accessible to guests (those not logged in as an approved user) is restricted. Further, the administrator of an entity can opt to limit the information about their entity made available to users.

The Registrar has put in place steps to verify the details of users of the IR, and has limited what can be done by those logged in anonymously (guests). Guests rights on the IR are limited to searching registrations, viewing the available documentation, and making an application to be the admin-

⁸Symantec Corp., Internet Security Threat Report, Vol. 16, at page 111–114.

istrator of an entity. Only approved users can avail themselves of the full services available on the IR, after their identity has been verified and confirmed using Public Key Infrastructure (PKI⁹), which is discussed in more detail later.

No intermediary registry staff

The Registrar has no involvement in the registration process for an individual registration. Once a user is approved, that user may complete registrations in accordance with the Regulations for the International Registry (Regulations) and the Procedures for the International Registry (Procedures).¹⁰ The Registrar has no administrative input in making registrations, thus eliminating the risk of data entry errors by IR staff. Further, this ensures greater efficiency for registering parties as there is no delay in processing registrations once submitted, other than any delay in waiting for another named party to consent to the registration. Once the IR receives final consent, registrations go live and become searchable worldwide.

Many paper-based registries and some partially-electronic registries require the registering person to submit the data to an official and it is the official who enters the data. This can lead to liability for the Registrar. With a notice-based electronic registry system, this is no longer necessary if adequate non-repudiation technology is used. The IR uses PKI

⁹PKI is a suite of technologies relying on asymmetric encryption i.e. the ability to encrypt data with one key and then only to be able to decrypt it with a second key generated at the same time as the first. One key in the pair is designated Private and the other is designated Public. Public keys are associated with individual people or specific organisations in a digital certificate, issued by a trusted party known as a Certification Authority (CA), allowing a third party to verify the source of a message by decrypting it with a user's Public key, hence proving that it had been encrypted with the user's Private key. Data encrypted with a user's Private key is considered to be electronically or digitally signed. This is a specialised area in Computer Science and cannot be comprehensively described in a footnote. It is well described in many on-line resources for readers looking for further information.

¹⁰See Section 5 Regulations (4th ed.) and Section 12 Procedures (5th ed.). A Transacting User Entity (TUE) administrator is automatically authorised to effect registrations on behalf of that TUE. A TUE user or a Professional User Entity (PUE) administrator or user must be authorised by the administrator of a TUE in order to make registrations on behalf of that TUE. Authorisation must be sought in respect of each specific aircraft object. Only a TUE can be a named party in a registration. PUEs, when authorised by a TUE, may make registrations on behalf of that TUE.

for non-repudiation, which is considered the gold standard for electronic signatures.

Data integrity

Of fundamental concern for the Registrar is protecting the integrity of the data held. It is submitted that an unauthorised addition, deletion or modification of a record is more difficult to detect in an electronic registry than in a paper-based registry where missing or extra pages are easily noticed, as are records which have been overwritten or altered. To the human eye, an electronic record which has been tampered with is indistinguishable from one which retains its integrity. As a result, *more sophisticated safeguards are required by an electronic registry to protect against unauthorised changes.*

The IR has put in place a Tamper Check¹¹ alarm that alerts the Registrar to any unauthorised interference with the IR databases. Independent of this, each party to a registration must confirm their consent to a registration by applying their digital signature, which is stored as an integral part of the registration data, thereby ensuring the integrity of each individual record, or group of records.

IV. The Registrar's Role

The Registrar's role is essentially mechanical in nature. The Registrar can explain how something can be done or discuss technological limitations but is neither qualified nor in a position to advise on whether or why something should be done or whether a registration is valid. *A laissez faire* approach has been adopted by the Registrar rather than the, alternative, paternalistic option. The users of the IR are assumed to be sophisticated or at least to have access to sophisticated advisors. The asset value is high and the legal framework is complex. They make their own decisions.

The Registrar performs its duties in accordance with the Convention, Protocol, Regulations and Procedures for the International Registry. The operation of the IR is governed by the terms of the Regulations and the Procedures issued by the Supervisory Authority,¹² the Registrar can and does make suggestions regarding changes to the regulations and

¹¹Tamper Check is a bespoke software component, using PKI technology, developed by SITA SC, for the IR.

¹²The International Civil Aviation Organization (ICAO).

to the functionality of the IR Website to the Supervisory Authority. Such suggestions arise from the Registrar's experience and deep engagement with the Industry and the advice of its advisory board, the International Registry Advisory Board (IRAB).

V. Services Provided by the Registrar

In operating the IR, the Registrar provides support as described below.

Technical support

To access the IR, a user must have a computer with Internet access, an up-to-date browser and Java¹³ support. Technical issues sometimes arise with a user's PC, network, firewall or security settings and Registry Officials provide guidance for users although, beyond a certain level of complexity, a user must resolve their own local issues.

Issues to do with the operation of the IR website fall fully within the purview of Registry Officials. Registry Officials provide guidance to users on applying and renewing accounts, requesting authorisation and performing searches. Registry Officials also develop help material in the form of Quick Guides, Frequently Asked Questions and User Manuals. Video tutorials are available on the Internet.¹⁴

When technical issues arise on the IR Website itself, the Registrar is notified through many channels. Users will call, Registry Officials will notice and automatic monitoring systems will send electronic alerts directly to the Registrar and to the company that provides the technical support and hosting of the IR infrastructure. In such cases, the Registrar takes a co-ordinating role but relies on the technical expertise available to it. After the service has been restored, the Registrar ensures that steps are taken, where possible, to resolve any under-lying issues.

Account approval and Public Key Infrastructure

One area of activity for Registry Officials is the approval of applications for new user accounts. On a typical day, 20 applications are received from users wishing to become

¹³Java is a programming language and computing platform first released by Sun Microsystems in 1995. Sun Microsystems is now owned by Oracle.

¹⁴<http://www.youtube.com/user/IntlRegistry>.

Administrators for their entity. In all such cases, the users must complete an application form on the IR Website, pay the appropriate fee and provide the Registrar with certain documentation. During the process the user must select a password.

The RO checks the documentation and verifies the contact information before approving the account. Precision in the naming of entities is vital to ensure there is no confusion. The name applied for, must match the legal name of the entity, including any punctuation in the name.¹⁵ In some cases, a simple comma in a name can differentiate it from another entity. The IR operates in an international context, and the entities registering with it are in many jurisdictions, governed by different business registry rules, practices and naming conventions. As such, the approval of entity names is not a trivial matter. Applications are often declined due to a lack of precision in the entity name. While this may frustrate users, such precision is necessary.

The Registrar seeks to provide clarity for users of the IR and minimise any risk of confusion. However, there is a balance to be struck. This balance is achieved by remaining connected to the Industry and listening to its concerns. Without that feedback loop, the Registrar would risk becoming a bureaucratic burden on the Industry, which was certainly not the intention of the Treaty.

The key technology used on the IR is Public Key Infrastructure (PKI). The PKI technology is provided by VeriSign (now owned by Symantec Corporation), one of the most respected and trusted suppliers in an industry that is essentially about trust.

PKI allows a user to sign data (ensuring non-repudiation) and to encrypt data (ensuring privacy). PKI is a complex system that requires a high level of security. This technology allows the Registrar to confirm that registration data was signed by the parties to the registration and that the data has not changed since it was stored. Effectively, PKI allows the registration records to be relied upon to a level of evidence which would be acceptable in a court of law. The disadvantage of using such technology is that it can seem cumbersome to users.

¹⁵Section 10.1 Procedures (5th ed.) states that the name applied for must be the correct legal name.

In the balance of security versus usability, PKI leans towards security.

For instance, if users forget their password, it is technically impossible for the Registrar to recover or reset that password. A new digital certificate must be issued. Users often find it difficult to understand why the Registrar cannot just reset their password as happens with other on-line systems. However, the IR is a system where each record must be looked upon as potential evidence in a future court case and, as such, higher standards of security apply. Some other electronic registries do not use PKI, relying instead on a simple password. This may be appropriate where the asset value is lower or where the legal regime is different, but the use of PKI is appropriate for the IR.

Data integrity and electronic evidence

Data integrity is maintained through technological means based upon PKI and digital certificates. Registration data is stored in a manner to allow detection of any tampering such as—

- An individual registration or data within a registration being altered
- The insertion of a registration
- The removal of a registration

The design of the IR system also ensures that registration data is digitally signed by the users and by the Registrar. This means that a user cannot repudiate the data, *i.e.*, claim not to have submitted or consented to it.

A registration is deemed to be complete when it is searchable.¹⁶ Therefore, users and relying parties should confirm that a registration is complete by performing a Priority Search and obtaining and verifying the data on a Priority Search Certificate (PSC) in order to satisfy themselves that a registration is complete. Simply entering the data or receiving an automated email from the IR system saying that the registration is live, is not sufficient. The requirement to search to confirm a registration, is to deal with cases where registration data is submitted, but due to a technological failure, is not stored in the IR database. Once a user

¹⁶Art. 19(2) of the Convention states: “A registration, if valid, shall be complete upon entry of the required information into the International Registry data base so as to be searchable.”

confirms, by way of a PSC, that the data is searchable, that user may rely on the Registrar to ensure the data never changes and retains its priority based upon the time of registration.

Searching to confirm a registration is complete is more than best practice, it is essential to protect the registering parties' positions. The Regulations and Procedures state that any party wishing to confirm that a registration has been correctly made may undertake a priority search.¹⁷

MSN¹⁸

Another important activity carried out by Registry Officials is receiving object identification information (MSN files) from manufacturers and uploading it to the IR so the data is available for users to select when making registrations or requesting authorisation to work on aircraft objects.

Although the Registrar is not liable for data it receives, some high level checking of the data for gross errors is carried out and consultations are held with manufacturers. Manufacturers are not liable for the information they provide and such information can only be used subject to acceptance of the Manufacturers' disclaimer which is posted on the web site.

On average, 40 manufacturer files are received and processed monthly. Where manufacturer data is not available, registering parties may enter the object identification data manually (sometimes called free text). The Regulations favour manufacturer-supplied data over data which is free text¹⁹ into the system and many users seek help from the Registrar in asking manufacturers to provide updated files. The Registrar recognises and appreciates the support of the manufacturers.

VI. Services Not Provided by the Registrar

Having set out above what services are offered by the Reg-

¹⁷Section 6.2 Regulations (5th ed.) and Section 12.6 Procedures (5th ed.).

¹⁸MSN stands for Manufacturer Serial Number. This is the serial number issued by the manufacturer and inscribed on the airframe, engine or helicopter. Along with the name of the manufacturer and the generic model designator, the MSN uniquely identifies the equipment. The files received from manufacturers containing that identification information are called MSN files.

¹⁹Section 5.1 Regulations (5th ed.).

istrar, it is appropriate to look also at what the Registrar cannot do.

Legal advice

The Registrar cannot provide legal advice.²⁰ Frequently, users will contact the helpdesk with queries that Registry Officials are not in a position to answer. These include:

- Registration Information: Registry Officials cannot provide any information on what data should be entered in a registration, or what type of registration should be made.
- Advice on analysing Priority Search Certificates: PSCs set out, in chronological order, all registrations made against a specified aircraft object, including amendments and discharges. Each interest, amendment, and discharge is assigned a unique file number.

While the Registrar cannot offer legal advice, there are useful publications for practitioners in the area, to supplement the primary legal texts. Most notably Professor Sir Roy Goode’s Official Commentary²¹ and the Aviation Working Group’s Practitioners’ Guide,²² both provide information on the IR and legal analysis.

Mediate

The Registrar does not provide mediation, or adjudication, in respect of disputes arising between users of the IR. The Registrar will remain impartial and will not become involved in such disputes under any circumstances.

Confirm validity of registrations

The IR is a notice-based registration system. No documents are submitted on the IR, nor is the existence or validity of the interest verified by the Registrar. The primary

²⁰Section 9.5 Procedures (5th ed.) “The help desk is for technical support only and cannot provide support on other matters, including legal questions.”

²¹Professor Sir Roy Goode CBE, QC, Official Commentary to the Convention on International Interests in Mobile Equipment and Protocol thereto on Matters specific to Aircraft Equipment, Unidroit, Third Edition 2013) (hereinafter: the “Official Commentary”).

²²The Legal Advisory Panel of the Aviation Working Group, The Practitioners’ Guide to The Cape Town Convention and The Aircraft Protocol (Revised 2012).

concern of the Registrar is the integrity, as opposed to the accuracy, of the data.

The notice-based system leads to a simplified registration system, for both registering and searching parties. It also leads to a more efficient system, as the Registrar is not exposed to the cumbersome administrative process of seeking and verifying documentation.²³

The order of registration determines priority, but, where a dispute arises it is for the registering parties to show not only that they have priority but also that the registered interest was validly created, and is properly reflected in the registration.²⁴

Court proceedings and the Registrar

Under Article 44(1) of the Convention the courts of Ireland, being the place in which the Registrar has its centre of administration, have exclusive jurisdiction to award damages or make orders against the Registrar. In recognition of the importance of expediting cases involving the Registrar proceedings against the Registrar, other than proceedings in which only damages are claimed, may be brought in the Commercial Court.²⁵ The Commercial Court, a division of the High Court, promotes timely resolutions of cases and aims to minimise the costs associated with commercial litigation.

Article 44(3) of the Convention refers to circumstances in which a party fails to comply with an order of a court having jurisdiction under the Convention, directing them to amend or discharge a registration. In such cases, the courts of Ireland may direct the Registrar to take the steps necessary to give effect to that order.

²³See, generally, United Nations Commission on International Trade Law (UNCITRAL) *Legislative Guide on Secured Transactions*, United Nations Publication, Sales No. E.09.V12, March 2010, ISBN 978-92-1-133675-7 (hereinafter: “the UNCITRAL Guide”). In particular, see pp. 110–113 for a discussion of “Registration in a general security rights registry.”

²⁴See Section 3.2 Regulations (5th ed.) “Since the International registry merely provides notice of registrations, the facts underlying any such registration or registered interest shall determine whether it falls within the scope of the Convention or the Protocol.”

²⁵The Rules of The Superior Courts in Ireland were amended to facilitate this. See Statutory instrument No. 31/2008—Rules of the Superior Courts (Cape Town Convention) (2008)—available at <http://www.irishstatutebook.ie/2008/en/si/0031.html>.

The Convention and the Protocol are given effect in Irish law by the *International Interests in Mobile Equipment (Cape Town Convention) Act 2005*.²⁶ Section 7 of the 2005 Act designates the High Court as the relevant court for the purposes of the Convention and Protocol. Section 1(5) of the 2005 Act requires an applicant to name the Registrar as a Respondent if seeking any relief affecting an entry or registration on the International Registry. The Act refers to the “Official Commentary” as an authority that courts, or any other person interpreting the Convention and Protocol, should refer to. Given the status afforded to the “Official Commentary” by the legislation, in the jurisdiction which enjoys exclusive jurisdiction to make orders against the Registrar, this is undoubtedly the leading authoritative text in relation to the Convention and the Protocol.

The Registrar, at the time of writing, has twice been a named party in court proceedings. The applicant in each case sought an order to have the Registrar discharge registrations on the IR pursuant to Article 44 of the Convention. Both cases concerned the same interest type, Registrable Non-Consensual Rights or Interests (RNCRI), which are provided for in Article 40 of the Convention. This is an opt-in provision which only applies to the extent that a Contracting State has made an Article 40 declaration.²⁷ The declaration will list the categories of rights and interests that may be registered as a RNCRI.²⁸ Where a declaration has been made, a properly registered RNCRI will have priority over subsequently registered interests and unregistered interests. Registration of a RNCRI requires only the consent of the Holder of the RNCRI.

²⁶ Available at <http://www.irishstatutebook.ie/2005/en/act/pub/0015/index.html>.

²⁷ At the time of writing, 28 Contracting States have made Article 40 declarations.

²⁸ Examples of rights and interests included in Article 40 declarations made by Contracting States include; judgments or orders for attachment of an aircraft object in partial or full satisfaction of a legal judgment; liens or rights of a State entity for unpaid taxes or other charges; and wages and expenses for assistance or recovery in respect of the aircraft.

The first case involving the Registrar, *PNC Equipment Finance LLC -v- Aviareto Limited and Link Aviation LLC*,²⁹ centred on RNCRI registered on the IR against an airframe and each of its associated engines. The two parties were formed in the United States, the aircraft was registered in the United States, and the lease agreement was entered into in, and governed by the laws of, the United States. The United States has not made an Article 40 declaration. A Minnesota court order directed the discharge of the registrations, however, the registrations were not discharged. The applicant brought proceedings seeking an order directing the Registrar to discharge the registrations. The court was satisfied that the Minnesota court order was prima facie evidence that the registrations at issue should not have been made. An order was made directing Link Aviation LLC to discharge the registrations and, if it failed to do so within the stipulated timeframe, the Registrar was ordered to take the steps necessary to discharge the registrations. No appeal was submitted, and the Registrar discharged the registrations in February 2013, after the time limit to appeal the decision had expired.

Transfin-M Ltd v Stream Aero Investments S.A. and Aviareto Limited,³⁰ arose from a proposed sale of an aircraft from Transfin-M Ltd, a Russian incorporated company, to Stream Aero Investments S.A., a Panamanian incorporated company (Stream Aero). The court record shows that negotiations were not successful and a RNCRI was registered against the airframe, naming Stream Aero as the holder of the right. No prior court order was in existence, directing Stream Aero to discharge the registration, when the case came before the Irish courts. The applicant sought an order directly from the Irish court. The court accepted jurisdiction in the matter.³¹ It determined that the registration, which could not have been a valid registration as the relevant

²⁹PNC Equipment Finance LLC v Aviareto Limited and Link Aviation LLC Unreported, High Court 19 December 2012.

³⁰Transfin-M Ltd v Stream Aero Investments S.A. and Aviareto Limited, Unreported, Commercial Court 13th May 2013.

³¹Specifically under Order 11, Rule 1(f) and/or Rule 1(g), of the Rules of the Superior Courts Available at <http://www.courts.ie/rules.nsf/0/3f0ac1321ae70bbe80256d2b0046b3cd?OpenDocument>.

Contracting States had not made an Article 40 declaration,³² amounted to a tort committed in, and/or a nuisance existing in Ireland, and/or something which necessitated action to be taken within Ireland. The court determined therefore that it had jurisdiction over Stream Aero to make an *in personam* order directing it to discharge the RNCRI, and made an order accordingly. A contingent order was made directing the Registrar to discharge the registration in the event Stream Aero failed to do so. No appeal was submitted, and the Registrar discharged the registration in June 2013.

Both cases were processed in a timely manner. Proceedings in the first case were issued on October 26, 2012, and the case was determined on December 19, 2012. In the Stream Aero case, the RNCRI was registered on March 6, 2013, proceedings were issued on April 18, 2013, and the case was determined on May 13, 2013. The stay on the order, as directed to the Registrar, until the time limit to appeal the order has passed, is vital, as once something is done on the IR it cannot be easily undone. Finally, the court, noting that the Registrar is operated on a not-for-profit basis, ordered that both the Registrar and the applicant were entitled to their costs from both Link Aviation LLC and Stream Aero in the respective cases. The Court has set down a marker concerning costs.

VII. Status

The IR is recognised as a success. This was noted many times and by many speakers at the diplomatic Conference for the adoption of the draft Space Protocol (February 27—March 9, 2012, in Berlin (Germany)). Users of the system, through an independent customer satisfaction survey carried out in late 2012, provided overwhelmingly positive feedback and scored the IR with a weighted average score of 7.95/10 for its performance. This was the sixth such survey and each one has shown increased customer satisfaction and acceptance. With 58 States having ratified or acceded to the Convention and 52 to the Protocol (including the EU as regional economic integration organisation), it is clear that their analysis is that the CTC and AP provide tangible economic benefits.

³²The holder of the RNCRI was based in Panama, the seller of the aircraft was based in Russia, both States are Contracting States to the Convention but have not made Article 40 declarations. The aircraft was registered in the UK which is not a Contracting State to the Convention.

VIII. Innovation

When the IR website went live in 2006 it had been designed using the legal texts as a set of user requirements and with no industry experience; it was virgin territory. Also, due to the hard rules of how the Treaty would come into effect (three months after the eight state ratified) software developers had to make a working assumption that they were three months and 1 day away from needing the system built and tested. These factors contributed to the initial design of the IR website which was highly sequential in nature and developed using rapid development methodologies, which although rapid, proved more complex to maintain.

Over the first few years of operations extra features were added, bugs resolved and inconsistencies removed. In parallel, there was a maturing of the Regulations and Procedures (the sixth edition having recently been approved, but not yet brought into effect). ICAO as the Supervisory Authority and the Registrar had to find ways of coordinating the introduction of software with the publication of new regulations. The experience, in the first few years of developing software was of over optimistic estimates requiring the Supervisory Authority to be flexible to ensure alignment between the legal and the technological.

In 2007, a new feature was introduced allowing registrations in fractions of aircraft equipment. This served the needs of the “fractional ownership program” industry and their clients. This industry was particularly strong in the US. Although the Treaty did not deal with fractional ownership (for instance, the ability of a creditor to hold collateral interest in one eighth of an airframe), neither did it preclude it. The regulations were amended, the software was introduced, the practitioners’ guide was updated and, in time, the Official Commentary dealt with the matter. It was a comprehensive solution both technically and legally and could not have been introduced without deep industry engagement. This is but one example of the industry coordination that has helped ensure that all organs of the Treaty remain aligned and practical.

Another example of an innovation is the Transferrable Right To Discharge (RTD). This is a classic example of simple not being the same as easy. The IR and its IRAB advisors struggled with a problem for two years before coming up with what now appears to be a simple solution. The problem

related mainly to assignments. When a creditor assigned an interest on the IR, a new registration was created—the assignment. But the original interest, which could not be changed, listed the original creditor and therefore could only be discharged with that creditor's consent. The first, but wrong, solution proposed was that, at the time of the assignment, the right to discharge the original interest would also be assigned to the assignee. However, the industry advised us that, in some cases security interests were assigned temporarily (security assignments) and, in that case the original creditor would not want to assign also its discharge powers in the original registration. There were other difficulties also with this approach. Allowing a user to distinguish between different types of assignments was difficult under the Treaty. The eventual solution was to de-couple the assignment from the transfer of the right to discharge. So, at any time any creditor can transfer its RTD for any registration to another party. This flexibility allows the parties to make whatever arrangements they wish and the RTD transfer has now proved so popular that many assignees will not do an absolute assignment without simultaneously having the RTD transferred to them.

Of all the innovations at the IR, the Closing Room is the greatest leap. The details are described completely in a paper written by Bill Piels and Sue Huay Tan available on the Cape Town Academic Project Web Site.

As noted above, the original IR system (Generation I) was sequential in nature. Registrations had to be made one by one to ensure that priorities were maintained. So, a registering party would make a filing electronically and then would confirm it had gone live by doing a search. Once that was confirmed the next registration was made. This sequential approach introduced three difficulties 1) user error was more likely 2) the time to make registrations was excessive and 3) there was a need to coordinate all registrations by all parties to ensure the correct order was achieved. A new generation of the system, Generation II was needed.

The initial solution found was to allow Multiple Object Registration (MOR). For instance, a fleet of five aircraft, each with two engines is 15 objects. Rather than requiring the user to register 15 sales, followed by 15 loans and then 15 leases, MOR allows one sale to be entered and registered on all 15 objects in one go etc. This was introduced in

September 2013 and has proved very popular especially for large deals. It solves the time and user error problems noted above.

The Closing Room is a feature designed to solve the final problem, coordination. Consider a deal where 15 objects are being sold, financed by a senior lender and a junior lender and leased to an airline. The parties involved will be the Seller, Buyer (Lessor), Bank 1, Bank 2 and an airline (Lessee). The parties will agree the order of registration. So we have 15 objects, five parties and five registrations per object (Sale, Loan 1, Loan 2, Lease, Assignment of lease). The Closing Room takes a staged approach and allows the registrations to be ready to go when the deal closes.

In stage 1, one party is nominated as the coordinating entity. This party enters the data for each registration. All parties and others invited to do so, can review the intended registrations and their order. If all parties are satisfied, the Closing Room is locked (stage 2). Once locked, registration data cannot be edited. The registrations are now available for electronic consent and for payment. Once all parties have consented and the payment is made, the Closing Room is now available for submission (stage 3). Once submitted the IR ensures that the registrations go live in the intended order.

Once the Closing Room is locked parties can be assured that none of the registrations can go live unless they all go live and in the intended order. At this stage they are Pre-Registrations and have no effect under the Treaty. They become effective only when live and searchable, which happens after they are submitted.

The Closing room can be unlocked prior to submission at which stage all consents are revoked and the data is editable again bringing it back to stage 1. Even after a registration is signed, but before it goes live, a user can revoke its electronic signature. This level of flexibility matches the real world of aircraft finance closings.

The regulations for the Closing Room have been approved by the SA and are expected to become effective in 2014 when the Closing Room functionality becomes available.

Beyond this, the IR will be further enhanced to include computer-to-computer interfaces and, perhaps, to make it more accessible for mobile devices. Generation II represents a further milestone in the development of the IR website.

IX. Interests Which May Be Registered on the IR

The Convention creates the concept of an ‘international interest’, which may be registered on the International Registry, as the central registration type under the Convention. An international interest encompasses the following:

- An interest granted by the chargor under a security agreement,
- An interest vested in the conditional seller under a title reservation agreement, and
- An interest vested in the lessor under a lease agreement.³³

The formal requirements to constitute an international interest are quite straight-forward and easily satisfied, the agreement creating, or providing for the interest must be in writing and it must relate to an object of which the chargor, lessor or conditional seller has power to dispose. The agreement must enable the object to be identified in accordance with the Protocol — i.e. by reference to the manufacturer name, the generic model designation and the manufacturer’s serial number. Finally, in the case of a security agreement, the agreement must enable the secured obligations to be determined, however, it is not necessary that the maximum sum secured must be stated.

The Convention also provides for the registration of the following interest types:

- prospective international interest—an interest which is intended to be created as an international interest on the occurrence of a specified future event;
- assignment of an international interest;
- prospective assignment of an international interest;
- registrable non-consensual rights or interests;
- international interest acquired through legal or contractual subrogation;
- notice of national interests—interests arising under internal transactions, registered in a national registry of a Contracting State. By declaration of that Contracting State the interests are subject to the rules governing registration of interests, although they will in gen-

³³Art. 2 CTC.

eral have been excluded from other provisions of the Convention.³⁴

- subordination of any of the above interests.³⁵

The Protocol extends the scope of the Convention, as it applies to aircraft objects, to both outright sales, and prospective sales.³⁶ The formal requirements which must be satisfied by a Contract of Sale are similar to those set out above for an international interest, with the exception that the additional requirement in relation to security agreements does not apply.

In determining whether or not the Cape Town Convention applies to a particular transaction, one must have regard to the “connecting factors.” In the absence of a connecting factor the Convention will not apply to the transaction.³⁷

Article 3 sets out that the Convention will apply if the debtor is situated in a Contracting State. The debtor encompasses lessees, chargors and conditional buyers, and sellers under a contract of sale. The applicability of the Convention is not affected by whether or not the creditor is situated in a Contracting State.³⁸ A debtor is deemed situated in a Contracting State if:

- i. it is incorporated, or formed, under the laws of a Contracting State;
- ii. it is registered in, or has its statutory seat in, a Contracting State;
- iii. it has its centre of administration in a Contracting State; or

³⁴See generally paragraph 4.125 of the Commentary.

³⁵See Article 16 of the Convention. Article 60 also provides for the possibility of registering a pre-existing right or interest, in order to preserve the priority of that pre-existing right or interest under the applicable law. Registration does not convert the right or interest into an international interest.

³⁶Art. III AP.

³⁷In circumstances that the Convention does not apply, this does not exclude the possibility of registering an interest. Parties may wish to register an interest which is not covered by the Convention to put the world on notice of their interest in the aircraft object.

³⁸Art. 3(2) CTC.

- iv. it has its principal place of business in a Contracting State.³⁹

The Aircraft Protocol sets out a secondary connecting factor relating to the state of registration for the airframe or helicopter⁴⁰ (but not aircraft engines). If, at the time the agreement is concluded, the airframe or helicopter is registered (for the purposes of the Chicago Convention), or agreed to be registered, with a Contracting State, this alternative connecting factor will be satisfied.

If a transaction is covered by the Convention, it must be registered to protect the priority of the interests created by that transaction. Priority rules operate on a first to file basis, so a registered interest will enjoy priority over subsequently registered interests and over unregistered interests. This priority rule applies even if the registered interest was acquired with prior knowledge of an existing but unregistered interest.

X. How Registrations are Effected

It is interesting to note that the practical realities of how the IR system works, combined with the nature of the organisations wishing to make registrations, shapes the approach taken when using the IR. There are three main approaches—

— Transacting User Entity (TUE) makes registrations directly through an employee or legal advisor, *i.e.*, a directly controlled administrator

— Professional User Entity (PUE) makes registrations on behalf of one or more TUEs having being authorised, on a per-object basis, by the TUE or TUEs

— Professional Administrator (PA) makes registrations directly on behalf of a TUE having being contracted to do so, *i.e.*, controlled through a contract for professional administration services.

1. TUE with a directly controlled administrator

A TUE may appoint an administrator, often an employee or a legal advisor, to make registrations directly on the IR. The benefits are control, speed and reduced costs. This approach (Approach 1 above) is most likely where the complexity of the transactions is within the professional capabilities

³⁹Art. 4 CTC.

⁴⁰Art. IV(1) AP.

of the company. As the IR becomes simpler to use, with the introduction of Generation II, the use of this approach may grow at the expense of the other two approaches.

2. PUE authorised by a TUE

Many of the larger aircraft-owning firms, such as airlines, prefer to use the standard Professional User Entity approach (Approach 2 above) and authorise a PUE to make registrations on their behalf on a per-object basis. This works well for them as they have in-house legal expertise, and often engage legal advice on structuring a deal and then use the PUEs to co-ordinate the registrations.

One key benefit of using PUEs is that they can co-ordinate a complex set of registrations. Several TUEs sometimes appoint the same PUE to make registrations. This allows the parties to agree the order and details of the registrations and the PUE can execute the registrations on the IR as required. Without that co-ordinating role, the sequential nature of the IR can be a challenge for deals involving more than two parties. The Closing Room in Generation II will help to resolve this co-ordination problem and may, therefore, affect the PUE business. However, it is the Registrar's role to make the IR as efficient as possible and, as we have seen previously, the industry will adapt and may use the system in ways which are not now foreseen. The Closing Room will require the services of a nominated Controlling Entity and it is likely that this duty will fall to PUEs due to their independence and their trustworthiness.

3. TUE with a Professional Administrator

When the IR went live in 2006, it was anticipated that entities wishing to be named parties in registrations would take either Approach 1 or 2 above. A compromise approach, which some saw as the best of both worlds, developed (Approach 3 above) whereby entities established TUE accounts but appointed what could best be described as Professional Administrators (PAs) to administer these accounts.

The term "Professional Administrator" is not an official one nor is it to be found in the Regulations and Procedures. When we use this term here we refer to a professional, appointed as administrator for an entity but who is not an employee of or legal advisor to, that entity. A PA represents the entity solely for the purposes of making registrations on the IR and sometimes also for making local filings, for example

with the Federal Aviation Authority in the United States of America.

Several firms, particularly in Oklahoma (USA), have developed a line of business where they provide PA services to hundreds, and in some case thousands, of TUEs. The TUE agrees a contract with the firm providing the service and confirms to the Registrar that the PA is entitled to act as administrator for their TUE. This means that the TUE does not have to authorise registrations on a per-object basis. However, there is a loss of control, as the PA is empowered on the IR system to make all registrations on behalf of the TUE. If a disagreement arises, the TUE, often through their nominated Back-Up Contact,⁴¹ can request that the account be disabled and can then appoint a replacement administrator.

If a TUE decides to use a PA, it should satisfy itself that it has adequate contractual protection covering, *inter alia*, how the PA will manage and use the account on the IR, that the process for instructing the PA to make registrations is formally agreed, that the PA is required to inform it of any notices it receives from the IR and that the firm providing the PA service has adequate insurance and expertise. It may also be useful to include arrangements in the contract for the PA to assist in transferring the account to another administrator if necessary, to ensure that the PA will comply with the Regulations and Procedures and, most importantly, will maintain a secure IT infrastructure (including anti-virus, anti-spam and backup of the digital certificate).

One useful and free way of ensuring that the TUE is informed of registrations as they are being made is to require the PA to add the TUE email address to the notification list for each registration it makes. This ensures that many of the IR notices will come directly to the TUE as well as to its PA. It may also be useful to appoint the Back-Up Contact from within the ranks of the TUE, allowing direct control over the account in the case of a disagreement.

It is important to ensure that arrangements have been agreed, including who pays, when a PA leaves the employment of the firm providing PA services as there is a fee for replacing an administrator. The decision to use a PA should

⁴¹This is a person appointed by the entity pursuant to the Procedures, section 5.12 (5th ed.).

not be taken lightly, although it has proved successful for many TUEs when managed properly.

As noted at the start of this section, the practical realities of how the IR system works combined with the nature of the organisations wishing to make registrations shapes the approach taken when using the IR. As the IR changes, so too will the approaches adopted by users.

XI. Risks to the IR

Understanding the risks associated with operating the IR is important; however, there is very little objective data. This lack of data, in itself, may provide information, in that the IR has not been sued, nor has it been called upon as an expert witness since its inception.

In considering the risks associated with operating the IR, this paper focuses on management's experience and insights. These will evolve as cases arise and as problems present themselves. Management believes that the three main risks to the IR are complacency, human error and unknown technology assumptions.

The nature of the data stored in the IR database means that unrecognised errors are of most concern, the "unknown unknowns." The worst type of issue that could arise would be a systemic error which does not come to light for an extended period of time. For instance, should the technical mechanism of the IR for signing data and ensuring non-repudiation be invalid, this might not be obvious until a legal case arose and an expert witness was able to identify systemic errors in the implementation of that technology. Should that happen, all registrations could be called into question and this could undermine the IR. The IR has taken steps to mitigate these risks, such as employing expert security consultants to confirm that the implementation is adequate and that it remains so, and using the best in class provider of PKI technology. However, complacency must be avoided.

Complacency

The IR is an institution established under an international treaty. It has long-term objectives. Complacency is a risk. IR staff and management must remain constantly alert to risks and must not allow standards to slip. In fact, management must constantly improve standards and ensure that the company culture is one of progress and quality improvement.

The risk of losing the contract,⁴² regular external security reviews, annual customer surveys and regular ISO audits all help to ensure complacency does not arise. Leadership is also important in setting an expectation that standards must continuously improve.

Human error

Should human error affect the IR, it is likely to be gross error. The IR system is designed to avoid human error by Registry Officials. The website (IR Application) simply does not allow Registry staff to interact with registration data. However, in the background, several technical staff, in particular Database Administrators (DBAs) have, by necessity, access to the IR system directly rather than through the IR Application. For instance, a DBA could make changes to the IR database by mistake. Were that to happen, it would be noticed by the Tamper Check element of the IR application. To mitigate against these risks the Registrar only contracts with highly reputable firms. Technology and process controls seek to ensure that an individual could not cause damage and that any damage would be noticed and would be capable of being fixed. As new technologies become available, the Registrar must ensure that such risks are contained.

Unknown technology assumptions

Since the IR's inception browser technology, as just one example of end-user technology, has changed significantly. It is now possible to use multiple tabs and to auto-fill fields. These options were unknown at the time the IR was initially developed. High-quality software development will make as few assumptions as possible but it will always be necessary to make some. Unknown technology assumptions can lead to unexpected behaviours in the IR when external changes make these assumptions invalid. To avoid this, high-quality software development is important as is the constant development of the IR system which ensures that it stays current and understood by a group of experts.

UNCITRAL⁴³ has developed a Legislative Guide on Secured Transactions⁴⁴ (the UNCITRAL Guide). Chapter IV, section 54 of the UNCITRAL Guide deals with data integrity

⁴²The Registrar operates under a five-year contract from the SA.

⁴³The United Nations Commission on International Trade Law.

⁴⁴Published March 2010, ISBN 978-92-1-133675-7.

and preservation. This section notes the differences between paper and electronic records and points out that

it is very difficult to re-construct a paper-based registry if the physical records are damaged or destroyed.

It goes on to state that for an electronic registry

*it is much easier to ensure the preservation of data in the registry.*⁴⁵

Management's view at the IR is somewhat different, either due to its responsibility for ensuring data integrity or due to its experience in electronic and computer systems. *It appears that lawyers have more confidence in electronic systems than engineers.*

Although it is true that electronic systems can be easily backed up and that copies of the database and records can be stored at geographically separated locations, this addresses only one aspect of data integrity (large-scale physical threats). It is true that one flood or fire could not destroy the electronic records of the IR, unless that fire or flood was of biblical proportions. The physical vulnerability is small for well-designed electronic registries. However, the logical vulnerability is large. When a registration is made on the IR, it is immediately replicated to a second site. In fact, due to the nature of the technology, there are several identical copies of the data on both the main and the back-up sites. Although this reduces the physical vulnerability, it provides a channel for bad data to replicate automatically and immediately from one copy of the data to another.

For instance, if malware managed to remove or alter data in the primary database, it would not need to attack back-up copies; the system, which is designed to ensure that data is always available, would finish the job for it. Similarly, a DBA could delete all electronic records in error. Although it would be possible to go back to previous backup that could be up to 24 hours old and any registrations made in the meantime would be lost. While this paper does not seek to review all of the security aspects of operating an electronic registry, it is important that management be fully aware of the risks associated with storing data electronically. Complacency is the real risk. The IR has appropriate controls in place against these risks.

By using best practice in the field of electronic registry

⁴⁵The UNCITRAL Guide, at 163.

design and operation and by remaining vigilant, Aviareto is well positioned to ensure data integrity of the electronic records over which it is custodian. However, IR management believes that the UNCITRAL Guide does not set-out fully the risks associated with electronic registries.

XII. Success Through Good Governance

The Treaty and its IR are considered a success. The volumes of transactions completed on the system, the results of annual customer satisfaction surveys along with the number of State ratifications are objective indicators of that success. Understanding this success might serve future electronic registries whether pursuant to the Cape Town Convention or not.

Aviareto believes that the key success factor has been *good governance*.

The IR must never become an ivory tower, hiding behind regulations and stifling change. The five-year contract ensures that Aviareto does not become complacent in its operation and development of the IR.

Good governance is achieved because of shareholders' objectives, industry engagement, the expertise of the Supervisory Authority, the adoption of relevant standards and management's insistence on looking for objective views of the company's performance.

Aviareto's shareholders are SITA⁴⁶ (80%) and the Irish Government (20%). As the International Registry is not for profit, these shareholders seek something else. In both cases, it is the same thing: their objective is reputational gain. This is the reason for Aviareto's very low appetite for risk.

Aviareto has engaged deeply with the industry through its advisory board (the International Registry Advisory Board, IRAB). The IRAB is composed of many world-leading experts in aviation finance and international commercial law, practitioners and academics. The IRAB met 16 times during 2010 and 2011 to discuss changes to the IR system and to propose changes to the Regulations and Procedures. Many ideas, such as the transferrable right to discharge and the Closing Room arose out of IRAB discussions. It is a place

⁴⁶The parent company of Aviareto Limited, owning 80%, is Compagnie Internationale de Participations SA (CIP SA), a company incorporated in Belgium. CIP SA is owned by SITA Société Coopérative which is also registered in Belgium and is owned by over 500 of the world's airlines.

where modern electronic practice meets modern legal practice. The Registrar appreciates the commitment of IRAB members and the expertise and time they have dedicated, *pro bono*, to this work. They have served the public good with distinction.

The expertise of the Supervisory Authority has been critical to the success of the IR. ICAO was involved with the Aircraft Protocol from a very early stage and was heavily involved in the diplomatic Conference in Cape Town in 2001. The work of any such supervisory authority should not be underestimated. It requires expertise, high-calibre professional staff, adequate resources, an industry-focused practical approach and sound judgement.

The IR has adopted appropriate ISO standards in the operation of its business. Article 28 of the Convention sets out the Registrar's liability with the following exception:

except where the malfunction is caused by an event of an inevitable and irresistible nature, which could not be prevented by using the best practices in current use in the field of electronic registry design and operation, including those related to back-up and systems security and networking.

There is no definitive best practice for electronic registries so the Registrar has taken the approach of adopting internationally recognised standards, which it believes are appropriate to electronic registries. To date, three standards have been successfully adopted, *i.e.*, ISO 27001:2005, ISO 9001:2008 and ISO 22301:2012, the first relating to ICT security, the second to quality management and the third to business continuity management. The Registrar is audited annually by the British Standards Institute for ISO 27001 and ISO 22301 and by the National Standards Authority of Ireland for ISO 9001. This gives an independent external view of the IR. The Registrar has an interest in developing internationally recognised standards in this area, although efforts in this regard have proved unfruitful to date.

Another external view of the quality of the IR is achieved through annual security reviews by leading ICT security consultancy firms. The practice adopted by the Registrar for Registry system security is to conduct a full security audit each year and to follow that up, roughly six months later, with a review of progress on the issues raised in the Audit.

In 2007, Aviareto began the practice of seeking the views of customers through an annual, independently operated,

on-line survey. This customer satisfaction survey is based on a set of 17 identical questions that allowed comparisons to be made between years.

In each of the 17 areas, and for every year since the survey began, the performance score has improved. The weighted average score has improved annually, as can be seen in Figure 1 below. The weighted average score weighs the performance in areas that are most important to users higher than the performance score in areas of less importance to them. A 10-point scale is used and the composite score (excluding fees) is now 7.95/10. Each year, Aviareto management, through the ISO 9001 system, identifies actions it can take to improve the customer experience.

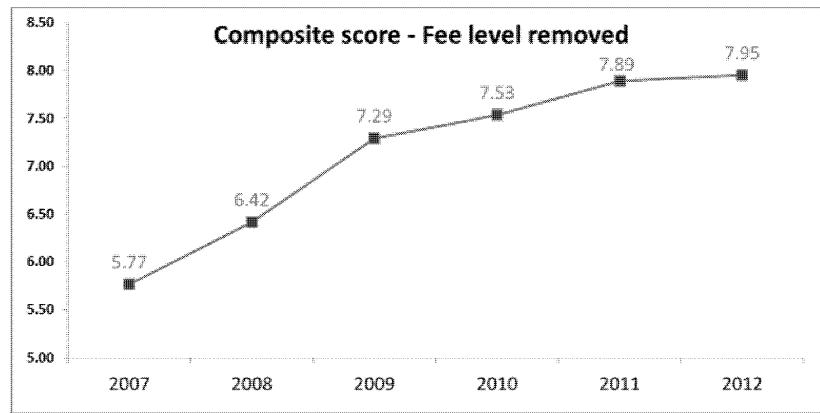


Fig. 1—Customer Satisfaction Survey

XIII. Conclusion

The Registrar is responsible for ensuring electronic registrations can be made efficiently and, once made, remain unchanged forever. The Aviareto team remains focused on this simple goal while not underestimating the complex challenges it faces.

Our work is important; we are keepers of records, written in electronic stone.

XIV. Appendix 1—Terms and Acronyms

AP	The Aircraft Protocol	The Protocol to the Convention on International Interests in Mobile Equipment on Matters specific to Aircraft Equipment, signed at Cape Town (South Africa) on 16 November 2001.
AWG	The Aviation Working Group	An industry representative group that drove the adoption and proper implementation of the Cape Town Convention and Aircraft Protocol. See www.awg.aero .
CTC	The Cape Town Convention	The Convention on International Interests in Mobile Equipment, signed at Cape Town (South Africa) on 16 November 2001 (the Cape Town Convention).
DBA	Data Base Administrator	A person with specialised technical skills for managing and maintaining an electronic database.
Digital Certificates	Issued by a Certificate Authority	A Digital Certificate associates an individual person or a specific corporate entity with a Public key. That Public key is part of a key pair. The other key in the pair, called the Private key, is held securely by the individual person or specific corporate entity. This arrangement allows non-repudiation to be established i.e. electronic signatures.
ICAO	The International Civil Aviation Organisation	A specialised UN body established under the Chicago Convention to drive aviation safety standards worldwide. HQ in Montreal, Canada.
IRAB	The International Registry Advisory Board	Established by Aviareto (the Registrar) to advise it on the efficient operations of the IR and the needs of the industry. This group of lawyers, working pro bono, has guided the Registrar and is an important element in ensuring close alignment with industry needs.

Java	Java	Java is a programming language and computing platform first released by Sun Microsystems in 1995. Sun Microsystems is now owned by Oracle
MSN	Manufacturer Serial Number	MSN stands for Manufacturer Serial Number. This is the serial number issued by the manufacturer and inscribed on the airframe, engine or helicopter. Together with the name of the manufacturer and the generic model designator, the MSN uniquely identifies the equipment. The files received from manufacturers containing that identification information are called MSN files.
OC	Official Commentary	Professor Sir Roy Goode CBE, QC, Official Commentary to the Convention on International Interests in Mobile Equipment and Protocol thereto on Matters specific to Aircraft Equipment, Unidroit, Third Edition 2013).
PKI	Public Key Infrastructure	A set of technologies and processes using asymmetric encryption to allow non-repudiation and data privacy over an unsecured network.
PSC	Priority Search Certificate	A certificate issued by the IR, listing all registrations against an individual airframe, engine or helicopter in the order they were received.
PUE	Professional User Entity	An entity account on the IR allowing a user to make a registration on behalf of a TUE.
RO	Registry Official	An official of the IR having the power to approve PUE and TUE administrator accounts and complete other administrative functions.
SA	The Supervisory Authority	ICAO was appointed as the Supervisory Authority for the International Registry by the Diplomatic Conference that produced the Cape Town Convention and Aircraft Protocol
SITA	A technology company specialising in the Aviation Industry and owned by 600 airlines from around the world	The parent company of Aviareto Limited, owning 80%, is Compagnie Internationale de Participations SA (CIP SA), a company incorporated in Belgium. CIP SA is owned by SITA Société Coopérative which is also registered in Belgium and is owned by over 500 of the world's airlines.
Tamper Check	Tamper Check	Tamper Check is a bespoke software component, using PKI technology, developed by SITA, for the IR to alert if a record is altered without authority.

INTERNATIONAL REGISTRY FOR AIRCRAFT EQUIPMENT

Treaty	The Convention and Protocol	The Convention on International Interests in Mobile Equipment, signed at Cape Town (South Africa) on 16 November 2001 (the Cape Town Convention) and the Protocol to the Convention on International Interests in Mobile Equipment on Matters specific to Aircraft Equipment, signed at Cape Town (South Africa) on 16 November 2001.
TUE	Transacting User Entity	A person or entity wishing to be a named party in a registration on the IR.
UNIDROIT	International Institute for the unification of private law	The International Institute for the Unification of Private Law (Unidroit) is an independent intergovernmental Organisation with its seat in the Villa Aldobrandini in Rome. Its purpose is to study needs and methods for modernising, harmonising and co-ordinating private and in particular commercial law as between States and groups of States and to formulate uniform law instruments, principles and rules to achieve those objectives. It is the Depository for the Treaty; see www.unidroit.org .