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Electricity metering – Payment systems – Part 41: Standard transfer specification (STS) – Application layer protocol for one-way token carrier systems

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICITY METERING – PAYMENT SYSTEMS –

Part 41: Standard transfer specification (STS) – Application layer protocol for one-way token carrier systems

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 62055-41 has been prepared by IEC technical committee 13: Electrical energy measurement and control.

This second edition cancels and replaces the first edition issued in 2007. It constitutes a technical revision. The main technical changes with regard to the previous edition are as follows:

- Class 2 token is extended to include credit transfer for gas and water with associated extensions in the display/test tokens.
- MfrCode is extended from 2 to 4 digits.
- Three token identifier base dates are defined to provide for more frequent key changes with TID roll-over procedures.
- A code of practice for the management of TID roll-over key changes in association with the revised set of base dates.
- Some clarifications and additional examples have been added.

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- reconfirmed,
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INTRODUCTION

The IEC 62055 series covers payment systems, encompassing the customer information systems, point of sale systems, token carriers, payment meters and the respective interfaces that exist between these entities. At the time of preparation of this standard, IEC 62055 comprised the following parts, under the general title, *Electricity metering – Payment systems:*

Part 21: Framework for standardization

Part 31: Particular requirements – Static payment meters for active energy (classes 1 and 2)

Part 41: Standard transfer specification – Application layer protocol for one-way token carrier systems

Part 51: Standard transfer specification – Physical layer protocol for one-way numeric and magnetic card token carriers

Part 52: Standard transfer specification – Physical layer protocol for a two-way virtual token carrier for direct local connection

Part 4x series specify application layer protocols and Part 5x series specify physical layer protocols.

The standard transfer specification (STS) is a secure message protocol that allows information to be carried between point of sale (POS) equipment and payment meters and it caters for several message types such as credit, configuration control, display and test instructions. It further specifies devices and codes of practice that allow for the secure management (generation, storage, retrieval and transportation) of cryptographic keys used within the system.

~~The national electricity utility in South Africa (Eskom) first developed and published the STS in 1993 and transferred ownership to the STS Association in 1998 for management and further development. It is currently the only open system for one-way payment meters and to date there are more than 4 million STS payment meters in the field, being used by approximately 400 utilities in 28 countries. The STS has been stable for 10 years, is the *de facto* industry standard at national and international level and hence has been developed as an IEC standard with the appropriate reformatting to comply with WG15 work. The primary application of the STS has been for use with payment meters without a tariff employing energy-based tokens, but it could be applied to currency-based token systems.~~

~~Prior to the development of the STS a variety of proprietary payment meters and POS equipment had been developed, which were, however, not compatible with each other. This gave rise to a definite need among the major users to move towards standardized solutions in addressing operational problems experienced where various types of payment meter and POS equipment had to be operated simultaneously. A standard transfer specification was developed that would allow for the application and inter-operability of payment meters and POS equipment from multiple manufacturers in a payment metering installation.~~

~~Two encryption algorithms are in this standard. The STA is used in existing systems, while the DEA may be considered for future systems.~~

The token carrier, which is not specified in this part of IEC 62055, is the physical device or medium used to transport the information from the POS equipment to the payment meter. Three types of token carriers are currently specified in IEC 62055-51 and IEC 62055-52; the magnetic card, the numeric token carrier and a virtual token carrier, which have been approved by the STS Association. New token carriers can be proposed as new work items through the National Committees or through the STS Association.

Although the main implementation of the STS is in the electricity supply industry, it inherently provides for the management of other utility services such as water and gas. It should be noted that certain functionalities may not apply across all utility services, for example, MaximumPowerLimit in the case of a water meter. Similarly, certain terminology may not be appropriate in non-electrical applications, for example, Load Switch in the case of a gas meter. Future revisions of the STS may allow for other token carrier technologies like smart cards and memory keys with two-way functionality and to cater for a real-time clock and complex tariffs in the payment meter.

Not all the requirements specified in this standard are compulsory for implementation in a particular system configuration and as a guideline, a selection of optional configuration parameters are listed in Clause C.11.

~~The STS Association has established D-type liaison with working group 15 of IEC TC 13 for the development of standards within the scope of the STS and is thus responsible for the maintenance of any such IEC standards that might be developed as a result of this liaison.~~

The STS Association is registered with the IEC as a Registration Authority for providing maintenance services in support of the STS (see Clause C.1 for more information).

Publication of IEC 62055-41 Ed 1 in May 2007 resulted in its rapid adoption as the preferred global standard for prepayment meters in many IEC member countries and a majority of IEC affiliate member countries. Prepayment electricity meters and their associated Payment Systems are now produced, operated and maintained by an ecosystem of utilities, meter manufacturers, meter operators, vending system providers, vending agents, banking institutions and adjacent industries. Multi-stakeholder interests are served by the STS Association comprising of more than 130 organisations located in over 24 countries. Interoperability and conformance to the Standard Transfer System (STS) are guaranteed by Conformance test specifications developed and administered by the STS Association. A full list of the STS Association services can be found at http://www.sts.org.za.

Developed originally for prepayment electricity meters in Africa – via an IEC TC13 WG15 D-type liaison with the STS Association – this IEC standard now serves more users in Asia than Africa, with a total of approximately 35 million meters operated by 400 utilities in 30 countries. Management of the technology has been administered by the STS Association in fulfilment of its role as the IEC appointed Registration Authority.

Global success has brought about an urgent need to extend the range of the numerical elements contained in IEC 62055-41 tables. In particular, the range of manufacturer numbers need to be extended beyond the 99 numbers originally provided. Also, application of the standard has been extended to cater for multi-energy systems including gas and water meters. Accordingly, there is a need to ensure that the content of IEC 62055-41 is maintained to cater for this market growth and multi-energy extensions.

Several corrections and clarifications are also required to bring Ed 1 up to date with current practice. This was considered by TC13 WG15 at its meeting on the 20 September 2012 in London, where it was agreed that IEC 62055-41 should be revised.

Only the most urgently required revisions have been incorporated in Edition 2 due to timing constraints, but it is anticipated that Edition 3 will consider further revisions to incorporate the following functionalities:

- Currency transfer
- Enhanced security on par with contemporary industry practice
- Complex functions fully harmonized with DLMS/COSEM suite
- Decentralized key management system with distributed architecture
- Conformance certification test suite in conjunction with IECEE CB scheme

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning special reserved token identifier given in 6.3.5.2.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from:

Address: Itron Measurement and Systems, P.O. Box 4059,TygerValley 7536, Republic of South Africa
Tel: +27 21 928 1700
Fax: +27 21 928 1701
Website: http://www.itron.com

Address: Conlog (Pty) Ltd, P.O. Box 2332, Durban 4000, Republic of South Africa
Tel: +27 31 2681141
Fax: +27 31 2087790
Website: http://www.conlog.co.za

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ISO (www.iso.org/patents) and IEC (http://patents.iec.ch) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this International Standard may involve the use of a maintenance service concerning encryption key management and the stack of protocols on which the present International Standard IEC 62055-41 is based [see Clause C.1]. The IEC takes no position concerning the evidence, validity and scope of this maintenance service.

The provider of the maintenance service has assured the IEC that he is willing to provide services under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the provider of the maintenance service is registered with the IEC. Information may be obtained from:

Address: The STS Association, P.O. Box 868, Ferndale 2160, Republic of South Africa
Tel: +27 11 061 5000
Fax: +27 86 679 4500
Email: sts@vdw.co.za
Website: http://www.sts.org.za

ELECTRICITY METERING – PAYMENT SYSTEMS –

Part 41: Standard transfer specification (STS) – Application layer protocol for one-way token carrier systems

1 Scope

This part of IEC 62055 specifies the application layer protocol of the STS for transferring units of credit and other management information from a point of sale (POS) system to an STS-compliant payment meter in a one-way token carrier system. It is primarily intended for application with electricity payment meters without a tariff employing energy-based tokens, but may also have application with currency-based token systems and for services other than electricity.

It specifies:

- a POS to token carrier interface structured with an application layer protocol and a physical layer protocol using the OSI model as reference;
- tokens for the application layer protocol to transfer the various messages from the POS to the payment meter;
- security functions and processes in the application layer protocol such as the Standard Transfer Algorithm and the Data Encryption Algorithm, including the generation and distribution of the associated cryptographic keys;
- security functions and processes in the application layer protocol at the payment meter such as decryption algorithms, token authentication, validation and cancellation;
- specific requirements for the meter application process in response to tokens received;
- a scheme for dealing with payment meter functionality in the meter application process and associated companion specifications;
- generic requirements for an STS-compliant key management system;
- guidelines for a key management system;
- entities and identifiers used in an STS system;
- code of practice for the management of TID roll-over key changes in association with the revised set of base dates;
- code of practice and maintenance support services from the STS Association.

It is intended for use by manufacturers of payment meters that have to accept tokens that comply with the STS and also by manufacturers of POS systems that have to produce STS-compliant tokens and is to be read in conjunction with IEC 62055-5x series.

STS-compliant products are required to comply with selective parts of this International Standard only, which is the subject of the purchase contract (see also Clause C.11).

NOTE 1 Although developed for payment systems for electricity, the standard also makes provision for tokens used in other utility services, such as water and gas.

~~NOTE 2 STS-compliant products are required to comply with selective parts of this International Standard only, which should be the subject of the purchase contract (see also C.11).~~

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts), *International Electrotechnical Vocabulary* (available at <http://www.electropedia.org>)

~~IEC 60050-300, *International Electrotechnical Vocabulary (IEV) – Electrical and electronic measurements and measuring instruments – Part 311:* General *terms relating to measurements – Part 312:* General *terms relating to electrical measurements – Part 313: Types of electrical measuring instruments – Part 314: Specific terms according to the type of instrument*~~

IEC 62051:1999, *Electricity metering – Glossary of terms*

IEC 62055-21:2005, *Electricity metering – Payment systems – Part 21: Framework for standardization*

IEC 62055-31:2005, *Electricity metering – Payment systems – Part 31: Particular requirements – Static payment meters for active energy (classes 1 and 2)*

IEC 62055-51:2007, *Electricity metering – Payment systems – Part 51: Standard transfer specification (STS) – Physical layer protocol for one-way numeric and magnetic card token carriers*

IEC 62055-52:2008, *Electricity metering – Payment systems – Part 52: Standard transfer specification (STS) – Physical layer protocol for a two-way virtual token carrier for direct local connection*

ISO/IEC 7812-1:2006, *Identification cards – Identification of issuers – Part 1: Numbering system*

ISO/IEC 7812-2:~~2000~~2007, *Identification cards – Identification of issuers – Part 2: Application and registration procedures*

ANSI X3.92-1981, *American National Standard Data Encryption Algorithm, American National Standards Institute – Data Encryption Algorithm*

FIPS PUB 46-3:1999, *Federal Information Processing Standards Publication – Data Encryption Standard*

IEC 62055-41

Edition 2.0 2014-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electricity metering – Payment systems – Part 41: Standard transfer specification (STS) – Application layer protocol for one-way token carrier systems

Comptage de l'électricité – Systèmes de paiement – Partie 41: Spécification de transfert normalisé (STS) – Protocole de couche application pour les systèmes de supports de jeton unidirectionnel

IEC 62055-41:2014-05(en-fr)

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Tel: +27 21 928 1700
Fax: +27 21 928 1701
Website: http://www.itron.com

Address: Conlog (Pty) Ltd, P.O. Box 2332, Durban 4000, Republic of South Africa
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Tel: +27 11 061 5000

Fax: +27 86 679 4500

Email: sts@vdw.co.za

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ELECTRICITY METERING – PAYMENT SYSTEMS –

Part 41: Standard transfer specification (STS) – Application layer protocol for one-way token carrier systems

1 Scope

This part of IEC 62055 specifies the application layer protocol of the STS for transferring units of credit and other management information from a point of sale (POS) system to an STS-compliant payment meter in a one-way token carrier system. It is primarily intended for application with electricity payment meters without a tariff employing energy-based tokens, but may also have application with currency-based token systems and for services other than electricity.

It specifies:

- a POS to token carrier interface structured with an application layer protocol and a physical layer protocol using the OSI model as reference;
- tokens for the application layer protocol to transfer the various messages from the POS to the payment meter;
- security functions and processes in the application layer protocol such as the Standard Transfer Algorithm and the Data Encryption Algorithm, including the generation and distribution of the associated cryptographic keys;
- security functions and processes in the application layer protocol at the payment meter such as decryption algorithms, token authentication, validation and cancellation;
- specific requirements for the meter application process in response to tokens received;
- a scheme for dealing with payment meter functionality in the meter application process and associated companion specifications;
- generic requirements for an STS-compliant key management system;
- guidelines for a key management system;
- entities and identifiers used in an STS system;
- code of practice for the management of TID roll-over key changes in association with the revised set of base dates;
- code of practice and maintenance support services from the STS Association.

It is intended for use by manufacturers of payment meters that have to accept tokens that comply with the STS and also by manufacturers of POS systems that have to produce STS-compliant tokens and is to be read in conjunction with IEC 62055-5x series.

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NOTE Although developed for payment systems for electricity, the standard also makes provision for tokens used in other utility services, such as water and gas.

2 Normative references

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IEC 62055-51:2007, *Electricity metering – Payment systems – Part 51: Standard transfer specification (STS) – Physical layer protocol for one-way numeric and magnetic card token carriers*

IEC 62055-52:2008, *Electricity metering – Payment systems – Part 52: Standard transfer specification (STS) – Physical layer protocol for a two-way virtual token carrier for direct local connection*

ISO/IEC 7812-1:2006, *Identification cards – Identification of issuers – Part 1: Numbering system*

ISO/IEC 7812-2:2007, *Identification cards – Identification of issuers – Part 2: Application and registration procedures*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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COMPTAGE DE L'ÉLECTRICITÉ – SYSTÈMES DE PAIEMENT –

Partie 41: Spécification de transfert normalisé (STS) – Protocole de couche application pour les systèmes de supports de jeton unidirectionnel

AVANT-PROPOS

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8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.

La Norme internationale IEC 62055-41 a été établie par le comité d'études 13 de l'IEC: Mesure de l'énergie électrique, contrôle des tarifs et de la charge.

Cette deuxième édition annule et remplace la première édition, parue en 2007. Cette édition constitue une révision technique. Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- Le jeton de Classe 2 est étendu de façon à inclure le transfert de crédit pour le gaz et l'eau et les extensions associées dans les jetons display/test.
- MfrCode est étendu de 2 à 4 chiffres.
- Trois dates de référence d'identificateur de jeton sont définies pour des changements de clé plus fréquents avec des procédures de passage par zéro de l'identificateur de jeton (TID).

- Un code de bonnes pratiques pour la gestion des changements de clé par passage par zéro de l'identificateur de jeton (TID) en association avec l'ensemble révisé de dates de référence.
- Des clarifications et des exemples supplémentaires ont été introduits.

Le texte de cette norme est issu des documents suivants:

CDV	Rapport de vote
13/1530/CDV	13/1553/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de la série IEC 62055, publiées sous le titre général *Comptage de l'électricité – Systèmes de paiement*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de cette publication ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives à la publication recherchée. A cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

INTRODUCTION

La série IEC 62055 couvre les systèmes de paiement, englobant les systèmes d'informations des consommateurs, les systèmes de points de vente, les supports de jetons, les compteurs de paiement et les interfaces respectives qui existent entre ces entités. Au moment de la préparation de la présente Norme, l'IEC 62055 comprenait les parties suivantes, sous le titre général, *Équipements de comptage de l'électricité – Systèmes de paiement:*

Partie 21: Cadre pour la normalisation

Partie 31: Exigences particulières - Compteurs statiques à paiement d'énergie active (classes 1 et 2)

Partie 41: Spécification de transfert normalisé (STS) - Protocole de couche application pour les systèmes de supports de jeton unidirectionnel

Partie 51: Spécification de transfert normalisé – Protocole de couche physique pour supports de jeton à carte magnétique et numérique unidirectionnel

Partie 52: Spécification de transfert normalisé – Protocole de couche physique pour support de jeton virtuel bidirectionnel pour raccordement local direct

La série des Parties 4x spécifie les protocoles de couche application et la série des Parties 5x spécifie les protocoles de couche physique.

La Spécification de transfert normalisé (Standard transfer specification - STS) est un protocole de message sécurisé qui permet de transporter des informations entre des équipements de point de vente (Point of sale - POS) et des compteurs de paiement. Elle permet plusieurs types de message tels que les consignes concernant le crédit, la maîtrise de la configuration, l'affichage et les essais. Elle spécifie en outre les dispositifs et les codes de pratique pour permettre la prise en charge de la gestion sécurisée (génération, stockage, retrait et transport) des clés cryptographiques utilisées au sein du système.

Le support de jeton, qui n'est pas spécifié dans la présente Partie de l'IEC 62055, est le dispositif ou support physique utilisé pour transporter les informations, et ce, de l'équipement de POS vers le compteur à paiement. Trois types de supports de jetons sont actuellement spécifiés dans l'IEC 62055-51 et dans l'IEC 62055-52; la carte magnétique, le support de jeton numérique et un support de jeton virtuel, qui ont été approuvés par la STS Association. De nouveaux supports de jeton peuvent être proposés comme nouvelles études par l'intermédiaire des Comités nationaux ou par l'intermédiaire de la STS Association.

Bien que la principale mise en œuvre de la STS se situe dans l'industrie d'alimentation en électricité, elle permet la prise en charge de la gestion d'autres services d'une entreprise de distribution comme l'eau et le gaz. Il convient de noter que certaines fonctionnalités peuvent ne pas s'appliquer dans tous les services d'une entreprise de distribution, un exemple en étant "MaximumPowerLimit" dans le cas d'un compteur d'eau. De même, certaines terminologies peuvent ne pas être appropriées dans des applications hors du domaine de l'électricité, un exemple en étant "Load Switch" dans le cas d'un compteur de gaz. Les révisions futures de la STS peuvent permettre la prise en charge d'autres technologies de supports de jeton comme les cartes intelligentes et les clés à mémoire avec une fonctionnalité bidirectionnelle et permettre une horloge temps réel et des tarifs complexes dans le compteur à paiement.

Toutes les exigences spécifiées dans la présente Norme ne sont pas obligatoires pour une mise en œuvre dans une configuration particulière de système. À titre de lignes directrices, un choix de paramètres de configuration facultatifs est énuméré à l'Article C.11.

La STS Association est enregistrée auprès de l'IEC comme une Autorité d'enregistrement pour fournir des services de maintenance en appui à la STS (voir Article C.1 pour plus d'informations).

La publication de l'IEC 62055-41 Éd. 1 en mai 2007 a conduit à son adoption rapide comme la norme globale préférentielle pour les compteurs de prépaiement dans plusieurs pays membres de l'IEC et dans une majorité de pays membres affiliés à l'IEC. Des compteurs d'électricité pour le prépaiement et leurs systèmes de paiement associés sont maintenant produits, exploités et maintenus dans un écosystème d'entreprises de distribution, de constructeurs de compteurs, d'opérateurs de compteurs, de fournisseurs de système distributeur, d'agents de vente, d'institutions bancaires et d'industries adjacentes. Les intérêts pluripartites sont servis par la STS Association comportant plus de 130 organisations sises dans plus de 24 pays. L'interopérabilité et la conformité au Système de transfert normalisé (STS) sont garanties par des spécifications d'essai de conformité développées et gérées par la STS Association. Une liste complète des services de la STS Association peut être consultée à l'adresse http://www.sts.org.za/.

Initialement développée pour des compteurs d'électricité de prépaiement en Afrique - par l'intermédiaire d'une liaison de type D du groupe de travail WG 15 du Comité d'études 13 de l'IEC avec la STS Association - la présente Norme IEC sert maintenant plus d'utilisateurs en Asie qu'en Afrique, avec un total d'environ 35 millions de compteurs exploités par 400 entreprises de distribution dans 30 pays. La gestion de la technologie a été administrée par la STS Association dans le cadre de l'accomplissement de son rôle d'Autorité d'enregistrement désignée par l'IEC.

Le succès global a engendré un besoin pressant d'étendre la gamme des éléments numériques contenus dans les tableaux de l'IEC 62055-41. En particulier, il est nécessaire d'étendre la plage des numéros de constructeurs au-delà des 99 numéros initialement fournis. En outre, l'application de la norme a été étendue pour permettre des systèmes d'énergies multiples comprenant des compteurs de gaz et d'eau. En conséquence, le besoin existe d'assurer que le contenu de l'IEC 62055-41 est maintenu pour permettre cette croissance du marché et ces extensions à énergies multiples.

Plusieurs corrections et clarifications sont également requises pour réactualiser l'Édition 1 par rapport à la pratique courante. Cela avait été envisagé par le groupe de travail WG 15 du CE 13 lors de sa réunion du 20 septembre 2012 à Londres. Selon l'accord conclu, il convient de réviser l'IEC 62055-41.

Seules les révisions requises les plus urgentes ont été incorporées dans l'Édition 2 en raison des contraintes de temps, mais il est prévu que l'Édition 3 envisage des révisions supplémentaires afin d'incorporer les fonctionnalités suivantes:

- Transfert de devises
- Sécurité renforcée allant de pair avec les pratiques industrielles contemporaines
- Fonctions complexes pleinement harmonisées avec la suite DLMS/COSEM (Device Language Message Specification/Companion Specification for Energy Metering, à savoir "Spécification des messages de langage de dispositif/Spécification d'accompagnement pour le comptage d'énergie
- Système de gestion décentralisée de clés avec une architecture distribuée
- Suite d'essais de certification de conformité conjointement avec la Méthode OC de l'IECEE

La Commission Electrotechnique Internationale (IEC) attire l'attention sur le fait qu'il est déclaré que la conformité avec les dispositions du présent document peut impliquer l'utilisation d'un brevet intéressant l'identificateur de jeton réservé spécial indiqué en 6.3.5.2.

L'IEC ne prend pas position quant à la preuve, à la validité et à la portée de ces droits de propriété.

Le détenteur de ces droits de propriété a donné l'assurance à l'IEC qu'il consent à négocier des licences avec des demandeurs du monde entier, soit sans frais, soit à des termes et

conditions raisonnables et non discriminatoires. À ce propos, la déclaration du détenteur des droits de propriété est enregistrée à l'IEC. Des informations peuvent être demandées à:

Adresse: Itron Measurement and Systems, P.O. Box 4059, TygerValley 7536, Republic of South Africa
Tél: +27 21 928 1700
Fax: +27 21 928 1701
Site web: http://www.itron.com

Adresse: Conlog (Pty) Ltd, P.O. Box 2332, Durban 4000, Republic of South Africa
Tél.: +27 31 2681141
Fax: +27 31 2087790
Site web: http://www.conlog.co.za

L'attention est d'autre part attirée sur le fait que certains des éléments du présent document peuvent faire l'objet de droits de propriété autres que ceux qui ont été mentionnés ci-dessus. L'IEC ne saurait être tenue pour responsable de l'identification de ces droits de propriété en tout ou partie.

L'ISO (www.iso.org/patents) et l'IEC (http://patents.iec.ch) maintiennent des bases de données, consultables en ligne, des droits de propriété pertinents à leurs normes. Les utilisateurs sont encouragés à consulter ces bases de données pour obtenir l'information la plus récente concernant les droits de propriété.

La Commission Électrotechnique Internationale (IEC) attire l'attention sur le fait qu'il est déclaré que la conformité aux dispositions de la présente Norme Internationale peut impliquer l'utilisation d'un service de maintenance concernant la gestion de clé de chiffrement et la pile de protocoles sur lesquels est basée la présente Norme IEC 62055-41 [Voir Article C.1]. L'IEC ne prend pas position quant à la preuve, la validité et la portée de ces services de maintenance.

Le fournisseur du service de maintenance a donné l'assurance à l'IEC qu'il consent à fournir ces services aux demandeurs du monde entier, à des termes et conditions raisonnables et non discriminatoires. À ce propos, la déclaration du fournisseur du service de maintenance est enregistrée à l'IEC. Des informations peuvent être demandées à:

Adresse: The STS Association, P.O. Box 868, Ferndale 2160, Republic of South Africa
Tél.: +27 11 061 5000
Fax: +27 86 679 4500
Email: sts@vdw.co.za
Site web: http://www.sts.org.za

COMPTAGE DE L'ÉLECTRICITÉ – SYSTÈMES DE PAIEMENT –

Partie 41: Spécification de transfert normalisé (STS) – Protocole de couche application pour les systèmes de supports de jeton unidirectionnel

1 Domaine d'application

La présente Partie de l'IEC 62055 spécifie le protocole de couche application de la STS pour transférer des unités de crédit et autres informations de gestion, et ce, d'un système de point de vente (POS) vers un compteur à paiement conforme à la STS dans un système de support de jeton unidirectionnel. À l'origine, elle est destinée à être appliquée avec les compteurs à paiement d'électricité simple tarif utilisant des jetons basés sur l'énergie. Mais elle peut également être appliquée aux systèmes de jeton basés sur la monnaie et pour les services autres que l'électricité.

Elle spécifie:

- une interface POS/support de jeton structurée avec un protocole de couche application et un protocole de couche physique utilisant le modèle OSI comme référence;
- des jetons pour le protocole de couche application pour transférer les divers messages du POS vers le compteur à paiement;
- des fonctions et des processus de sécurité dans le protocole de couche application tels que l'Algorithme de transfert normalisé (Standard Transfer Algorithm) et l'Algorithme de chiffrement de données (Data Encryption Algorithm), y compris la génération et la distribution des clés cryptographiques associées;
- des fonctions et des processus de sécurité dans le protocole de couche application au niveau du compteur à paiement tels que les algorithmes de déchiffrement, l'authentification, la validation et l'annulation de jeton;
- des exigences spécifiques relatives au processus d'application de compteur en réponse aux jetons reçus;
- une méthode pour traiter de la fonctionnalité de compteur à paiement dans le processus d'application de compteur et les spécifications d'accompagnement associées;
- des exigences génériques relatives à un système de gestion de clé conforme à la STS;
- des lignes directrices pour un système de gestion de clé;
- des entités et des identificateurs utilisés dans un système STS;
- le code de bonnes pratiques pour la gestion des changements de clé par passage par zéro de l'identificateur de jeton (TID) en association avec l'ensemble révisé de dates de référence;
- le code de bonnes pratiques et les services de support à la maintenance provenant de la STS Association.

Elle est destinée à être utilisée par les constructeurs de compteurs à paiement tenus d'accepter les jetons conformes à la STS et aussi par les constructeurs de systèmes POS tenus de produire des jetons conformes à la STS. Elle est à lire conjointement avec la série IEC 62055-5x.

Les produits conformes à la STS sont tenus de se conformer à des parties sélectives de la présente Norme internationale seulement, celles-ci sont l'objet du contrat d'achat (voir aussi Article C.11).

NOTE Bien qu'elle ait été mise au point pour les systèmes de paiement pour l'électricité, la norme prend également des dispositions pour les jetons utilisés dans d'autres services d'entreprise de distribution, tels que l'eau et le gaz.

2 Références normatives

Les documents suivants sont cités en référence de manière normative, en intégralité ou en partie, dans le présent document et sont indispensables pour son application. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60050 (toutes les parties), *Vocabulaire Electrotechnique International* (disponible à <http://www.electropedia.org>)

IEC 62051:1999, *Electricity metering – Glossary of terms* (disponible en anglais seulement)

IEC 62055-21:2005, *Electricity metering – Payment systems – Part 21: Framework for standardization* (disponible en anglais seulement)

IEC 62055-31:2005, *Équipements de comptage de l'électricité – Systèmes à paiement – Partie 31: Exigences particulières – Compteurs statiques à paiement d'énergie active (classes 1 et 2)*

IEC 62055-51:2007, *Electricity metering – Payment systems – Part 51: Standard transfer specification (STS) – Physical layer protocol for one-way numeric and magnetic card token carriers* (disponible en anglais seulement)

IEC 62055-52:2008, *Electricity metering – Payment systems – Part 52: Standard transfer specification (STS) – Physical layer protocol for a two-way virtual token carrier for direct local connection* (disponible en anglais seulement)

ISO/IEC 7812-1:2006, *Identification cards -- Identification of issuers -- Part 1: Numbering system* (disponible en anglais seulement)

ISO/IEC 7812-2:2007, *Identification cards -- Identification of issuers -- Part 2: Application and registration procedures* (disponible en anglais seulement)

ANSI X3.92-1981, *American National Standard Data Encryption Algorithm, American National Standards Institute – Data Encryption Algorithm* (disponible en anglais seulement)

FIPS PUB 46-3:1999, *Federal Information Processing Standards Publication – Data Encryption Standard* (disponible en anglais seulement)