SEC 17a-4(f) & CFTC 1.31(b)-(c) Compliance Assessment
iTernity iCAS Solution

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Abstract

The iTernity Compliant Archive Solution (iCAS) is an object-based storage system with proprietary archiving capabilities and intrinsic integrated controls between the iCAS solution and the associated storage device. The iCAS solution bundles the record content with the corresponding metadata in proprietary archive containers, which are secured against manipulation and unauthorized deletion, when a retention expiration date has been assigned.

It is Cohasset's opinion that the iCAS solution, when properly configured and utilized, meets the seven storage-related and audit history-related requirements of SEC Rule 17a-4(f) and CFTC Rule 1.31(b)-(c) to:

- Record, store and retain immutable record objects in non-erasable and non-rewriteable format until the designated expiration date for retention and legal holds;

- Store record objects in an accurate and quality manner;

- Uniquely identify each record object, both original and duplicate; and

- Store and manage audit history related to the record objects.

See Section 2 for the details of Cohasset's assessment, Section 3 for a summary of Cohasset's conclusions, and Section 4 for an overview of the relevant SEC and CFTC Rules.

Cohasset Associates

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1. Introduction

The Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC) define rigorous and explicit requirements for organizations that elect to retain books and records on electronic storage media. Given the prevalence of electronic retention of books and records, these requirements apply to most broker-dealer and commodity future trading firms and other organizations with broker-dealer functions or operations.

To evaluate the capabilities of the iTernity Compliant Archive Solution (iCAS) relative to meeting these SEC and CFTC requirements, iTernity engaged Cohasset Associates, Inc. ("Cohasset") to complete an independent and objective assessment. The results of this assessment are presented in this report.

This introduction briefly summarizes the regulatory environment, explains the purpose and approach for Cohasset's assessment, and provides an overview of the iCAS solution.

1.1   Overview of the Regulatory Requirements

In 17 CFR §§ 240.17a-3 and 240.17a-4, the SEC stipulates recordkeeping requirements, including retention periods, for the securities broker-dealer industry. On February 12, 1997, the SEC adopted revisions to 17 CFR § 240.17a-4 (the "Rule" or "SEC Rule 17a-4"). These revisions to paragraph (f) expressly allowed books and records[1] to be retained on electronic storage media, subject to explicit conditions. Further, the SEC issued two Interpretive Releases (No. 34-44238 on May 1, 2001, and No. 34-47806 on May 7, 2003), which pertain specifically to the electronic storage media requirements of paragraph (f). This Assessment Report includes a summary of the Rule and these two Interpretive Releases in Section 4.1, *Overview of SEC Rule 17a-4(f) Electronic Storage Requirements*.

Additionally, the Financial Industry Regulatory Authority (FINRA) Rule 4511(c) definitively defers to the format and media requirements of SEC Rule 17a-4, for the books and records it requires.

In 17 CFR § 1.31 ("CFTC Rule 1.31"), the CFTC defines rigorous requirements for organizations electing to retain books and records on electronic storage media. The June 28, 1999, revisions were the first to authorize books and records to be retained on electronic storage media, subject to explicit conditions. This Assessment Report includes a summary of these requirements in Section 4.2, *Overview of CFTC Rule 1.31(b)-(c) Electronic Storage Requirements*.

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[1] Regulators use the phrase "*books and records*" to describe all content that must be retained under the Rules. Since this assessment deals with the capabilities of a storage solution relative to SEC Rules, Cohasset uses the term "record object" (versus "data" or "file") to be consistent with SEC terminology.

Additionally, for the comparable requirements of SEC Rule 17a-4(f) and CFTC Rule 1.31(b)-(c), see Section 4.3, *Comparison of Relevant Requirements of SEC and CFTC Rules.*

1.2   Purpose and Approach

iTernity engaged Cohasset to obtain an independent and objective assessment of the capabilities of the iCAS solution, version 3.7.0, in comparison to the requirements set forth in SEC Rule 17a-4(f) and CFTC Rule 1.31(b)-(c). As a highly respected consulting firm with specific and relevant knowledge, Cohasset has recognized expertise and more than 40 years of experience with the legal, technical and operational issues associated with the records management practices of companies regulated by the SEC and the CFTC. Additional information about Cohasset is provided in the last section of this report.

Cohasset was engaged to:

- Assess the iCAS solution in comparison to the seven requirements related to the recording, storage and retention of electronic records, and the associated audit system, as stipulated in SEC Rule 17a-4(f) and CFTC Rule 1.31(b)-(c), and

- Prepare this Assessment Report enumerating the results of its assessment.

This assessment represents the professional opinion of Cohasset and should not be construed as either an endorsement or a rejection by Cohasset of the iCAS solution and its capabilities. The information utilized by Cohasset to conduct this assessment consisted of: (a) oral discussions, (b) system documentation, (c) system administrator guidance, and (d) other directly-related materials provided by iTernity.

Only seven storage-related and audit history-related requirements, of the seventeen total requirements of the rule, are addressed in this report. In addition to applying the information in this Assessment Report, regulated entities must ensure that the combination of its policies, procedures and regulatory submissions, in conjunction with the capabilities of implemented solutions, meet all seventeen requirements of the Rule.

The content and conclusions of this assessment are not intended and must not be construed as legal advice. Relevant laws and regulations are constantly evolving and legal advice will be tailored to the specific circumstances of the organization. Therefore, nothing stated herein should be substituted for the advice of competent legal counsel.

1.3   iCAS Solution Overview

The iTernity iCAS solution is an object-based storage system with proprietary archiving capabilities and intrinsic integrated controls between the iCAS solution and the associated storage device. The iCAS solution bundles the record content with the corresponding metadata in proprietary archive containers, referred to as Content Storage Containers (CSCs). Each CSC record object[2] is secured against manipulation and unauthorized deletion.

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[2] The term "CSC record object" is used in this document to describe the consolidated elements that iCAS retains as an immutable record object: the content of the record, the system metadata and associated index.

Each CSC record object is assigned to an iCAS Account, which is associated to one iCAS Repository. Accordingly, the iCAS Accounts and Repositories logically organize and secure access to the CSC record objects.

The iCAS system offers two interfaces, used by client applications and document and content management systems, to access the iCAS archive:

- The iCAS application programming interface (iCAS API), and

- The iTernity File System Gateway (iFSG), which emulates a standard file system.

The iFSG interface provides additional functionality, including, but not limited to:

- The iFSG Share[3] can be configured to apply a minimum default retention duration to archived record objects.

- Multiple archiving modes are available under the iFSG interface, but are not available through the iCAS API interface.

- Both unprotected (unarchived) objects and archived record objects can be stored in the same repository of the iCAS solution through the iFSG interface.

When a record object is archived using either interface, the iCAS solution assembles a CSC record object, encompassing the content of the record, the system metadata and associated index.

When configured for compliance with the Rule, each CSC record object is:

- Immutable, uniquely identified, chronologically serialized and protected against data loss.

- Prevented from being deleted until: (a) the retention expiration date assigned to the CSC record object has passed; and, (b) any legal hold designated for the associated iCAS repository is removed.

- Duplicated, with the second copy stored separately from the original.

Additionally, iCAS maintains an audit history for all CSC record objects.

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[3] An iFSG **Share** is associated to an iCAS Account and is a top-level folder of the file system gateway (iFSG).

2. Assessment of Compliance with SEC Rule 17a-4(f)

This section presents Cohasset's assessment of the iCAS solution capabilities for compliance with the seven requirements related to the recording, storage and retention of electronic records, and the associated audit system, as stipulated in SEC Rule 17a-4(f). For a comparison of the SEC and CFTC Rules, see Section 4.3, Comparison of Relevant Requirements of SEC and CFTC Rules.

For each of the seven relevant requirements in SEC Rule 17a-4(f), this assessment is organized into the following four topics:

Compliance Requirement – Delineation of the electronic storage requirements of SEC Rule 17a-4(f) that are pertinent to the iCAS solution.

Compliance Assessment – Assessment of the iCAS solution capabilities in relation to compliance with the specific requirement of the Rule.

iCAS Solution Capabilities – Description of the iCAS solution capabilities that enable it to meet the specific requirement of the Rule.

Considerations – Identification of actions to be performed to meet the specific requirement of the Rule. In some cases, a consideration will only apply to the iCAS API or iFSG interfaces, due to the differences in capabilities for each interface.

The following subsections document Cohasset's assessment of the capabilities of the iCAS solution, relative to each pertinent requirement of the Rule.

2.1 Non-Rewriteable, Non-Erasable Record Format

2.1.1 Compliance Requirement SEC 17a-4(f)(2)(ii)(A)

Preserve the records exclusively in a non-rewriteable, non-erasable format.

As set forth in Section III (B) of the 2001 Interpretive Release, this requirement *"is designed to ensure that electronic records are capable of being accurately reproduced for later reference by maintaining the records in an unalterable form."*

The following statement in the 2003 Interpretive Release further clarifies that certain implementations of rewriteable and erasable media, such as magnetic disk or magnetic tape, meet the requirements of a non-erasable and non-rewriteable recording environment provided: (a) the storage solution delivers the prescribed functionality; and, (b) the functionality is delivered via appropriate integrated control codes for the SEC designated retention period associated with the stored records.

> *A broker-dealer would not violate the requirement in paragraph (f)(2)(ii)(A) of the rule if it used an electronic storage solution that prevents the overwriting, erasing or otherwise altering of a record during its required retention period through the use of integrated hardware and software control codes.*

Further, Section IV of the 2003 Release places requirements on the storage solution for retaining records beyond the SEC-established retention period when certain circumstances occur, such as a subpoena or hold order:

> *Moreover, there may be circumstances (such as receipt of a subpoena) where a broker-dealer is required to maintain records beyond the retention periods specified in Rule 17a-4 or other applicable Commission rules. Accordingly, a broker-dealer must take appropriate steps to ensure that records are not deleted during periods when the regulatory retention period has lapsed but other legal requirements mandate that the records continue to be maintained, and the broker-dealer's storage solution must allow records to be retained beyond the retentions periods specified in Commission rules. [emphasis added]*

This statement by the SEC clarifies that the storage solution must have the capability to retain records beyond the retention period established at the time of initial recording when required for legal matters, external investigations or audits, or other similar circumstances.

2.1.2   Compliance Assessment

It is Cohasset's opinion that the capabilities of the iCAS solution, version 3.7.0, meet this requirement of the Rule, when (a) properly configured and utilized to store and retain record objects[4] in non-erasable and non-rewriteable format and (b) the considerations identified in Section 2.1.4 have been satisfied.

2.1.3   iCAS Solution Capabilities

iCAS is an object-based storage solution that operates independently from client applications. iCAS has proprietary archiving capabilities and intrinsic integrated controls with the associated storage device, which are designed to prevent overwriting, deleting or modifying archived record objects for the duration of their designated retention period.

The iCAS solution has the following key features, which contribute to satisfying this requirement of SEC Rule 17a-4(f) for preserving broker-dealer electronic record objects as non-rewritable and non-erasable.

- When a record object is archived, the iCAS solution creates a Content Storage Container (CSC), which is referred to as a CSC record object[5] in this report.
  - ◆ A CSC record object encompasses the content of the record, the system metadata and associated index.
    - ■ The record content and system metadata of CSC record objects are immutable.

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[4] The term "record object," rather than just "object," is used in this Assessment Report to reflect that *books and records,* including records of business transactions, customer information and broker-dealer personnel, must be maintained for a specific period of time (the retention period) in accordance with regulatory requirements.

[5] The term "CSC record object" is used in this document to describe the consolidated elements that iCAS retains as an immutable record object: the content of the record, the system metadata and associated index.

- Index entries are immutable. Any modification to the index, such as to extend a retention period, is appended as a separate index file, without changing the existing index files.

    ◆ A CSC-ID uniquely identifies a single CSC record object. It is immutable and is comprised of the date and time the CSC record object is archived, the initial retention expiration date and the unique hash value of the CSC record object.

    ◆ Optionally, the CSC record object may be encrypted.

- The iCAS solution protects all CSC record objects from being overwritten or modified. Further, each CSC record object and its associated metadata and index are protected from deletion until both:

    ◆ The stipulated retention expiration date has passed; and,

    ◆ Any legal hold status has been removed from the associated iCAS Repository.

- For CSC record objects that require a **time-based retention period** (e.g. retain a record object for 6 years), when the CSC record object is archived, *either*:

    ◆ The client application must transmit the retention period stated as a stipulated retention expiration date for the CSC record object, or

    ◆ An appropriate default retention duration (or length of time) must be configured for the associated iFSG Share, which will automatically assign a retention expiration date to the CSC record object.

- For CSC record objects that require a **conditional (event-based) retention period** (e.g. retain a record object for 6 years <u>after</u> expiration of contractual obligations):

    ◆ When the CSC record object is archived, *either*:

        - The client application must transmit the initial retention period (e.g. 6 years), stated as a stipulated retention expiration date and time, or

        - A retention expiration date must automatically be assigned to the CSC record object based on an appropriate default retention duration (or length of time) configured for the associated iFSG share.

    ◆ If the condition or event has not occurred (e.g., the contractual obligations have not expired), before the assigned retention expiration date passes, the client application must extend (lengthen) the retention expiration date.

    ◆ After the condition or event occurs (e.g., the contractual obligations expire), the client application must assign a retention expiration date that represents the full retention period (e.g., 6 years after expiration of contractual obligations).

- The iCAS solution allows the client application to extend (lengthen), but **not** decrease (shorten), the retention expiration date.

- Further, iCAS will enforce the longest retention expiration date in cases where both an explicit retention expiration date is assigned to a CSC record object and a retention expiration date is calculated using the default retention duration assigned to an iFSG Share.

- Record objects required for subpoena or legal hold can be preserved by:

  - Extending the assigned retention expiration date to the estimated expiration date of the legal hold, if the retention expiration date is more recent than the estimated expiration date of the legal hold.

    - The retention expiration date must be continually extended through this process until the legal hold has terminated.

  - Designating a legal hold for the iCAS Repository.

    - Once all legal matters pertinent to the record objects have concluded, the legal hold designation on the iCAS Repository can be removed.

- An immutable CSC record object is created when an object is archived.

  - When using the iCAS API, all objects are archived as immutable CSC record objects when committed to storage.

  - When using the iFSG interface, unprotected files are archived as immutable CSC record objects using one of the following modes:

    - *On Read Only* archives an object when the *read only* metadata attribute is set.

    - *On Close* archives an object when it is closed.

    - *On Close Plus* adds versioning to the *On Close* mode. In this mode, the retention expiration date *cannot* be extended. Accordingly, this configuration does *not* comply with requirements of the Rule.

    - *On Policies* enables different archiving rules to be set for each iFSG Share: 1) *Read Only* and 2) *Last Modification*, which mimics the *On Close* archive mode.

  - The iCAS solution continuously monitors for unarchived objects and sends warnings to the iCAS Administrator.

- Root access permission (which provides system-level access to the functions, services and content of the iCAS solution) is not provided to any iCAS user. A login that is separate from the iCAS solution is required for root level access to the storage devices.

- The iCAS solution automatically detects discrepancies between its clock and the client application clock. When a difference of more than 10 minutes is identified, iCAS enters an error mode and notifies the iCAS Administrator of the error condition. Further, iCAS will *not* write a CSC record object with an archive date and time that is older than the last archived CSC record object.

2.1.4   Considerations

The following considerations for configuring and using the iCAS solution are provided for compliance with the non-erasable and non-rewriteable requirements of the Rule.

- The broker-dealer is responsible for:

  - Ensuring all record objects required to be retained for compliance with the Rule are immediately archived as a CSC record object;

  - Protecting the private key from loss and unauthorized access, if record objects are encrypted; and also providing access, if necessary, via a third party or escrow account, should the broker-dealer not be able to retrieve CSC record objects or provide access;

  - Assigning the correct retention expiration date for each CSC record object;

  - Extending retention expiration dates for CSC record objects that require event-based retention periods; and

  - Extending retention expiration dates for CSC record objects subject to a legal hold or designating a legal hold for the associated iCAS repository.

- When using the iFSG interface to archive CSC record objects, the *On Close Plus* archiving mode is prohibited, since it does **not** allow a retention expiration date to be extended.

- The iCAS license that allows retention periods to be shortened must **not** be activated. Also, the retention expiration date of 12/31/2999 must **not** be assigned to CSC record objects, since this setting allows the retention expiration date to be shortened.

- The WORM transition period, which allows CSC record objects to be deleted within ten minutes of being archived, must **not** be activated.

- The iCAS self-healing maintenance routines that protect archive paths of CSC record objects must be activated.

- The iCAS solution server clock must be configured to automatically synchronize to an external time clock to prevent premature deletion of record objects.

- Root access permission must be limited to a user that is independent from an iCAS solution user.

2.2   Accurate Recording Process

2.2.1   Compliance Requirement SEC 17a-4(f)(2)(ii)(B)

Verify automatically the quality and accuracy of the storage media recording process.

The intent of this requirement is to ensure both the accuracy and quality of the recording process; ensuring that the records read from the storage media are precisely the same as those that were recorded. This requirement includes both a quality verification of the recording process and post-recording verification processes.

2.2.2   Compliance Assessment

It is Cohasset's opinion that the capabilities of the iCAS solution, in conjunction with the inherent capabilities of advanced magnetic storage technology, meet this requirement of the Rule. Specifically, the iCAS solution verifies the quality and accuracy of the recording process during the initial recording of the record object and during read-back using post-recording verification. Additionally, self-healing maintenance routines automatically perform periodic integrity checks.

2.2.3   iCAS Solution Capabilities

The capabilities described below address both the initial recording and the post-recording verification processes of the iCAS solution.

2.2.3.1   Recording Process

- A combination of checks and balances in the advanced magnetic recording technology – such as inter-component and inter-step cyclical redundancy checks (CRCs) and write-error detection and correction – are relied upon to assure an accurate recording process.

- During write activities, the iCAS solution calculates and stores hash values, which are subsequently used for post-recording verification processes.

  - The iCAS solution calculates and stores hash values to validate the content of the record, system metadata, index and audit history.

2.2.3.2   Post-Recording Verification

- During read back of a CSC record object, the hash values of the content of the record, system metadata, index and audit history are verified for accuracy.

- If an error occurs during read back of a CSC record object, the storage solution error correction method is automatically applied. If corrections performed by the storage solution are unsuccessful in correcting the error, the iCAS solution automatically recovers the original CSC record object from a duplicate copy.

- iCAS can verify the write activities, using one of the following options:

  - *Verify:* integrity check of the CSC record object.

  - *Verify and Check Size:* integrity and size check of the CSC record object.

  - *Verify and Read-after-Write:* integrity check and read back of bytes for comparison.

  - *Read-after-Write:* read back of bytes for comparison.

- iCAS has self-healing maintenance routines that automatically correct missing or corrupt CSC record objects or file location paths, including:

  - Verification of hash values related to CSC record objects. If an error is identified, the CSC record object is recovered from the duplicate.

◆ Confirmation of each CSC record object path. If one of the paths is missing, the CSC record object will automatically be copied into the correct directory on that path.

◆ Verification of mapping tables, which store the relationship between CSC record objects and the file path.

2.2.4 Considerations

The following configuration considerations pertain to this requirement to automatically verify the quality and accuracy of the storage media recording process.

- The self-healing maintenance routines must be activated.

- The iCAS solution storage devices must be configured to use error correction methods equivalent to or better than RAID6[6].

- The *Read-after-Write* verification must be performed when using the *On Policies* asynchronous archiving mode of the iFSG interface.

- To assure that CSC record objects are written correctly, the CSC verification maintenance routine should be executed immediately after the write process.

2.3 Serialized Original and Duplicate Units of Storage Media

2.3.1 Compliance Requirement SEC 17a-4(f)(2)(ii)(C)

Serialize the original and, if applicable, duplicate units of storage media, and time-date for the required period of retention the information placed on such electronic storage media.

This requirement, according to Section III(B) of the SEC's 2001 Interpretive Release, *"is intended to ensure both the accuracy and accessibility of the records by indicating the order in which records are stored, thereby making specific records easier to locate and authenticating the storage process."*

While this requirement is thought to be more pertinent to tracking the individual units of removable media related to micrographic or optical storage, the SEC Rule may be satisfied by capturing index data or metadata associated with each electronic record that: (a) *uniquely* identifies the record; and, (b) associates the *date and time of recording* with each record.

2.3.2 Compliance Assessment

It is Cohasset's opinion that the capabilities of the iCAS solution meet this requirement of the Rule for serializing the original and duplicate record objects.

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[6] Redundant Array of Independent Disks (RAID): A method for recording data to magnetic disk devices that provides for various levels of error correction and read or write performance improvements. RAID6 employs striped disks with dual parity and combines four or more disks in a way that provides for correction of detected errors for up to as many as two full disk units of data during read back.

2.3.3   iCAS Solution Capabilities

- When a record object is archived, iCAS assigns a unique CSC-ID. The CSC-ID is comprised of the CSC archive date and time, the initial retention expiration date and a unique hash value.

- The CSC-ID is stored as immutable metadata of the original and duplicate CSC record object.

2.3.4   Considerations

There are no considerations related to this requirement.

2.4   Duplicate Copy of the Records Stored Separately

2.4.1   Compliance Requirement SEC 17a-4(f)(3)(iii)

Store separately from the original, a duplicate copy of the record stored on any medium acceptable under § 240.17a-4 for the time required.

The intent of this requirement is to provide an alternate storage source for accessing the records, should the primary source be compromised, i.e., lost or damaged.

Note: A "duplicate copy" is different from a "backup copy." A duplicate copy is the recording of each record to a second compliant storage solution or media, which is then retained for the same period of time as the originally stored record. A "backup copy," in contrast, is typically overwritten as it is "rotated" on a periodic basis, which usually results in a much shorter retention period than the length of time that the original record must be retained.

2.4.2   Compliance Assessment

It is Cohasset's opinion that the iCAS solution, when properly configured, meets this requirement of the Rule to duplicate the CSC record object and associated metadata.

2.4.3   iCAS Solution Capabilities

- iCAS functionality required to maintain a duplicate copy of each CSC record object, includes:

  - Configuring an *Additional Write Path* to duplicate the *Archive Path*;

  - Configuring an *Additional iFSG Base Path* to duplicate the mapping table that maintains the relationship between the filenames and the CSC-IDs, for objects stored using the iFSG interface;

  - Configuring an *Additional History Path*, for multi-path repositories, to duplicate the archive history, which will duplicate the index and retention expiration date.

2.4.4 Considerations

The following considerations pertain to the requirement to store separately a duplicate copy of the record objects.

- iCAS must be configured to maintain:

  - At least one *Additional Write Path* on a separate location from the *Archive Path*.

  - An *Additional iFSG Base Path*, if the object is stored using the iFSG interface.

  - An *Additional History Path,* for multi-path repositories.

2.5 Audit System

2.5.1 Compliance Requirement [SEC 17a-4(f)(3)(v)]

The member, broker, or dealer must have in place an audit system providing for accountability regarding inputting of records required to be maintained and preserved pursuant to §§240.17a-3 and 240.17a-4 to electronic storage media and inputting of any changes made to every original and duplicate record maintained and preserved thereby.

This requires an audit system which provides accountability for both: (a) initially inputting the original records; and, (b) tracking changes made to the records and associated metadata.

2.5.2 Compliance Assessment

It is Cohasset's opinion that the iCAS solution meets this requirement of the Rule by creating and preserving an audit history related to: (a) the recording of CSC record objects; and, (b) all events that result in authorized changes to the original and duplicate CSC record objects.

2.5.3 iCAS Solution Capabilities

- For each CSC record object, iCAS maintains a distinct audit history.

  - The audit history is stored as a separate log file.

  - A hash value is calculated and stored for each entry in the audit history.

- The audit history for each CSC record object includes the dates and times the:

  - CSC record object was archived;

  - Integrity of the CSC record object and CSC ID were verified;

  - CSC record object was read and viewed;

  - Hash value was read and the integrity of the CSC record object was evaluated;

  - CSC record object was deleted; and

  - Retention period was extended for a CSC record object.

2.5.4   Considerations

There are no considerations related to this requirement.

2.6   Availability of Audit System

2.6.1   Compliance Requirement [SEC 17a-4(f)(3)(v)(A)]

At all times, a member, broker, or dealer must be able to have the results of such audit system available for examination by the staffs of the Commission and the self-regulatory organizations of which the broker or dealer is a member.

The intent of this requirement is to ensure that the audit trail is available for examination, upon request by the SEC or self-regulatory organizations. The audit trail tracks the actions taken on the records or indexes, such as when, by whom and what records or indexes were altered, erased or overwritten.

2.6.2   Compliance Assessment

It is Cohasset's opinion that the iCAS solution meets this requirement of the Rule because it permits authorized persons to access, search, examine and download the audit history.

2.6.3   iCAS Solution Capabilities

- An authorized iCAS user may search and display the audit history for selected CSC record objects. The user may search, filter and sort the audit history.

- The authorized user may export the audit history of selected CSC record objects to Microsoft Excel® or comma-separated value (.csv) files, which may be provided to the examiner.

2.6.4   Considerations

There are no considerations related to this requirement.

2.7   Preservation of Audit Results

2.7.1   Compliance Requirement [SEC 17a-4(f)(3)(v)(B)]

The audit results must be preserved for the time required for the audited records.

It is the intent of this requirement to ensure that the audit trail is preserved for at least as long as the associated records.

2.7.2   Compliance Assessment

It is Cohasset's opinion that the iCAS solution meets this requirement of the Rule by maintaining and not allowing deletion of the audit history of all CSC record objects.

2.7.3 iCAS Solution Capabilities

- The audit history is maintained, without the capability to delete.

- When the CSC record object is deleted, the audit history is not deleted.

2.7.4 Considerations

There are no considerations related to this requirement.

3. Conclusion

This Assessment Report assesses the functionality of the iCAS solution, version 3.7.0, in comparison to the requirements for recording, storage and retention of electronic records, and the associated audit system, as stipulated in SEC Rule 17a-4(f) and the two associated SEC Interpretive Releases and the relevant requirements of the CFTC Rule 1.31(b)-(c).

It is Cohasset's opinion that the iCAS solution, when properly configured and utilized, meets requirements of the Rule to: (a) record, store and retain immutable record objects in non-erasable and non-rewriteable format and (b) store and manage an audit system related to the record objects.

Cohasset determined that the iCAS solution has the following capabilities that support its ability to meet the recording, storage, retention and audit system requirements. The iCAS solution:

- Archives record objects as immutable CSC record objects in a non-erasable and non-rewritable format.

- Protects all CSC record objects from deletion until the assigned retention expiration date has passed and any legal hold status designated for the repository has been removed.

- Assigns a unique CSC-ID to all CSC record objects that includes the creation date and time, the initial retention expiration date and the unique hash value of the CSC record object.

- Generates a hash value for all index and audit history entries to protect the retention expiration date and the accuracy of the index and audit history.

- Automatically verifies all hash values and uses self-healing maintenance routines for post-recording verification and correction.

- Duplicates all CSC record objects and associated metadata to a separate storage location.

- Maintains a distinct audit history for each CSC record object that tracks key lifecycle events; and allows authorized users to access, search, examine and download the audit history for selected CSC record objects.

Accordingly, Cohasset concludes that the iCAS solution meets the seven SEC 17a-4(f) and CFTC 1.31(b)-(c) requirements related to the recording, storage and retention of electronic records, and the associated audit system.

4. Overview of Relevant SEC and CFTC Requirements

This section establishes the context for the regulatory requirements that are the subject of this assessment by providing an overview of the SEC and CFTC regulatory foundation for allowing electronic records to be retained on a variety of compliant electronic storage media.

4.1 Overview of SEC Rule 17a-4(f) Electronic Storage Requirements

Recordkeeping requirements for the securities broker-dealer industry are stipulated by the United States Securities and Exchange Commission ("SEC") Regulations, including 17 CFR §§ 240.17a-3 and 240.17a-4. Specifically, SEC Rule 17a-4(f), when adopted on February 12, 1997, expressly allowed records to be retained on electronic storage media, subject to meeting certain conditions. Additionally, the Financial Industry Regulatory Authority (FINRA) Rule 4511(c) stipulates:

> *(c) All books and records required to be made pursuant to the FINRA rules shall be preserved in a format and media that complies with SEA Rule 17a-4.*

Three separate foundational documents collectively define and interpret the specific regulatory requirements that must be met for an electronic storage solution to be compliant with SEC Rule 17a-4(f). These are:

- The Rule itself, as modified over time by the SEC. These modifications to the original Rule have not affected the requirements for electronic storage media, which are the basis of this assessment. However, certain Interpretive Releases have clarified the context and meaning of certain requirements and conditions of the Rule.

- SEC Interpretive Release No. 34-44238, Commission Guidance to Broker-Dealers on the Use of Electronic Storage Media under the Electronic Signatures in Global and National Commerce Act of 2000 with Respect to SEC Rule 17a-4, dated May 1, 2001 (the "2001 Interpretive Release").

- SEC Interpretive Release No. 34-47806, Electronic Storage of Broker-Dealer Records, dated May 7, 2003 (the "2003 Interpretive Release").

In the Rule and the two subsequent interpretative releases, the SEC authorizes the use of electronic storage media and devices to satisfy the recordkeeping requirements of SEC Rules 17a-3 and 17a-4, when the system delivers the prescribed functionality. Specifically, Rule 17a-4(f)(1)(ii) states:

> *(f) The records required to be maintained and preserved pursuant to §§ 240.17a-3 and 240.17a-4 may be immediately produced or reproduced on "micrographic media" (as defined in this section) or by means of*

"electronic storage media" (as defined in this section) that meet the conditions set forth in this paragraph and be maintained and preserved for the required time in that form.
(1) For purposes of this section:
(ii) The term electronic storage media means any digital storage medium or system and, in the case of both paragraphs (f)(1)(i) and (f)(1)(ii) of this section, that meets the applicable conditions set forth in this paragraph (f).

The 2003 Interpretive Release further clarifies that implementation of rewriteable and erasable media, such as magnetic tape or magnetic disk, meets the requirements of a non-erasable and non-rewriteable recording environment, if the system delivers the prescribed functionality and appropriate **integrated control codes** are in place. The 2003 Interpretive Release states:

A broker-dealer would not violate the requirement in paragraph (f)(2)(ii)(A) of the rule if it used an electronic storage solution that prevents the overwriting, erasing or otherwise altering of a record during its required retention period through the use of integrated hardware and software control codes.

The key words within this statement are "integrated" and "control codes." The term "integrated" means that the method used to achieve a non-rewriteable, non-erasable recording environment must be an integral part of the recording hardware and software. The term "control codes" indicates the acceptability of using attribute codes (metadata), which are integral to the hardware and software of the recording process, to protect against overwriting or erasure of any records.

Examples of integrated control codes relevant to a non-rewriteable and non-erasable recording process are:

- A retention period during which the record object cannot be erased, overwritten or otherwise modified;

- A unique record identifier that differentiates each record from all other records; and

- The date and time of recording, which in combination with the unique identifier "serializes" the record.

The 2003 Interpretive Release specifically notes that recording processes or applications which merely mitigate the risk of overwrite or erasure (rather than prevent them), such as relying solely on access control security, will not satisfy the requirements of SEC Rule 17a-4(f).

Further, the 2003 Interpretive Release requires the storage solution to be capable of retaining records beyond the SEC-established retention period, when required by a subpoena, legal hold or other similar circumstances. In *Section IV. Discussion*, the 2003 Interpretive Release states:

Moreover, there may be circumstances (such as receipt of a subpoena) where a broker-dealer is required to maintain records beyond the retention periods specified in Rule 17a-4 or other applicable Commission rules. Accordingly, a broker-dealer must take appropriate steps to ensure that records are not deleted during periods when the regulatory retention period has lapsed but other legal requirements mandate that the records continue to be maintained, and the broker-dealer's <u>storage solution must allow records to be retained beyond the retentions periods specified in Commission rules.</u> [emphasis added]

An important associated requirement of SEC Rule 17a-4(f)(2)(i) is that a member, broker or dealer electing to electronically store its records required by SEC Rules 17a-3 or 17a-4, must notify its designated examining authority at least ninety (90) days prior to employing any technology other than write-once read-many ("WORM") optical media. Examining authorities are self-regulatory organizations (SROs) under the jurisdiction of the SEC, such as the Financial Industry Regulatory Authority (FINRA).

4.2 Overview of CFTC Rule 1.31(b)-(c) Electronic Storage Requirements

Recordkeeping requirements promulgated by Commodity Futures Trading Commission (CFTC) include 17 CFR § 1.31 (CFTC Rule 1.31). When effective on June 28, 1999, CFTC Rule 1.31 authorized entities under the regulatory jurisdiction of the CFTC to retain records on an electronic storage media or system, subject to the requirements and conditions of the Rule. The Commission has modified CFTC Rule 1.31 over time; however, these modifications have not substantively affected the explicit requirements for electronic storage media, which are the basis of this assessment.

However, recent changes to CFTC Rule 1.31(a)-(b), amended in response to The Dodd-Frank Wall Street Reform and Consumer Protection Act and effective January 2, 2013, significantly expanded the requirement for a regulated entity to retain its existing electronic records, which must be kept in *native file format*. CFTC Rule 1.31(b) states:

> *(b) Except as provided in paragraph (d) of this section, books and records required to be kept by the Act or by these regulations may be stored on either "micrographic media" (as defined in paragraph (b)(1)(i) of this section) or "electronic storage media" (as defined in paragraph (b)(1)(ii) of this section) for the required time period under the conditions set forth in this paragraph (b); Provided, however, For electronic records, such storage media must preserve the native file format of the electronic records as required by paragraph (a)(1) of this section. ***** [emphasis added]*

The CFTC Rule 1.31(a)(1) defines *native file format* as:

> ******[N]ative file format means an electronic file that exists in the format in which it was originally created.*

The issue of technology obsolescence and the need to migrate data from its current *native file format* is discussed in the November 2, 2012, Federal Register, which published the amended final rules. Specifically, *II. Comments Received and Amended Regulations*, includes the following excerpts:

> *[T]he Commission is now making clear that paper records are not usable by the Commission as a substitute for the underlying financial data used to create that paper.*
> *Therefore, it is necessary that electronic records be maintained in their native file format and not reduced to paper.*
> *Accordingly, for records that include data stored in a database, the ''native file format'' is the format in which the data is maintained in that database, not a format reduced to paper or imaged format, which is essentially the equivalent of paper.*
> *[T]he Commission confirms that maintaining data in native file format (i.e., the format in which it was originally created or maintained) does not prohibit a recordkeeper from migrating that data from an obsolete or legacy system or database to a new system or database, where it will then be maintained in the native file format of the new system or database. [emphasis added]*

Accordingly, the CFTC recognizes that the *native file format* may change over time, due to data migrations, for example.

It is important to emphasize that this requirement to retain electronic records in *native file format* does **not** change the requirements of CFTC Rule 1.31(b)-(c) for electronic storage media of the electronic records.

The electronic storage media requirements of CFTC Rule 1.31(b)-(c) are substantively the same as promulgated in the Federal Register on May 27, 1999. Further, these individual requirements are very similar to, and in some cases essentially identical to, the equivalent electronic storage solution requirements that are defined in SEC Rule 17a-4(f), including the requirement to *"Preserve the records exclusively in a non-rewriteable, non-erasable format."* When issuing the final Rule the Commission stated:

> *In view of the significant number of firms subject to regulation under both the federal commodity and securities laws, the final regulations recognize the value of maintaining consistency, where possible, between the Commission's approach to recordkeeping and that of the SEC. The regulations do not reflect strict conformity with the regulations the SEC adopted in 1997, however, because the Commission concluded that there were significant differences between the commodities and securities industry that justified retaining certain of its current rules.*

To evaluate the applicability of the SEC's Interpretive Releases, including authorized use of erasable and rewritable media, to the recordkeeping requirements of the CFTC, Cohasset reviewed the information published in the May 27, 1999, Federal Register. This Federal Register published the CFTC's adoption of the amendments to CFTC Rule 1.31 and contained the following excerpt in the *Supplementary Information*:

> *On several occasions during the past two years, the Commission has provided interim relief from the current requirements of Rule 1.31 to Commission registrants using advanced technology(44).*

In footnote (44), the Commission states:

> *The Commission has permitted these registrants to substitute compliance with the SEC's recordkeeping requirements for compliance with current requirements of Rule 1.31 ******

This footnote describes the CFTC's willingness to rely, where appropriate, on the SEC's rules and its history of granting permission to alternatively substitute compliance with the SEC's recordkeeping requirements, for compliance with the requirements of CFTC Rule 1.31. This suggests that it is reasonable to conclude that the CFTC would accept compliance with the SEC 2003 Interpretive Release as a substitute for, or a complement to, the Commission's rulemaking related to CFTC Rule 1.31(b)-(c).

In the *Supplementary Information* provided with CFTC Rule 1.31, the CFTC also acknowledges that registrants would benefit from the use of evolving storage media and technology, by stating:

> *The Commission recognizes the important role improved technology can play in the continued development of the futures industry. Minimizing unnecessary regulatory obstacles to the [adoption] of improved technology is a goal of industry members, customers, and the Commission.*

One basic difference between the CFTC Rule and the SEC Rule, is that the CFTC Rule only requires notification to the Commission prior to placing a compliant system into production. The SEC Rule,

however, requires the regulated entity to send a notification letter to the appropriate Designated Examining Authority (DEA) ninety (90) days prior to deploying a compliant non-WORM system.

Even though the CFTC has not issued any formal interpretive releases or statements subsequent to the effective date of CFTC Rule 1.31, nor have they indicated direct support of the SEC's 2003 Interpretive Release, it is Cohasset's opinion that the CFTC would interpret the use of advances in digital storage media and systems technology (such as erasable magnetic storage using the integrated control codes stipulated in the 2003 SEC Interpretive Release) as compatible with the vision and intentions of the CFTC for CFTC Rule 1.31(b)-(c).

Also see the following section for a comparison of the storage requirements of the SEC and CFTC Rules.

4.3   Comparison of Relevant Requirements of SEC and CFTC Rules

The individual relevant requirements cited in the body of this report are based on the wording in SEC Rule 17a-4(f). The SEC requirements that are cited in this report are very similar in number, principal and context, if not always in their wording, to requirements stated in CFTC Rule 1.31(b)-(c).

For cross reference, the table below provides a one-for-one comparison of the relevant recording, storage and retention requirements of SEC Rule 17a-4(f) with the similar requirements of CFTC Rule 1.31(b)-(c).

The following requirements reflect the most recent updates to SEC 17a-4(f)(2)(ii)(A)-(C) and CFTC 1.31(b)(1)(ii)(A)-(C).

SEC 17a-4 Requirement		CFTC 1.31 Requirement	
(f)(2)	If electronic storage media is used by a member, broker, or dealer, it shall comply with the following requirements:	(b)	Except as provided in paragraph (d) of this section, books and records required to be kept by the Act or by these regulations may be stored on either "micrographic media" (as defined in paragraph (b)(1)(i) of this section) or "electronic storage media" (as defined in paragraph (b)(1)(ii) of this section) for the required time period under the conditions set forth in this paragraph (b); Provided, however, For electronic records, such storage media must preserve the native file format of the electronic records as required by paragraph (a)(1) of this section.
(f)(2)(ii)	The electronic storage media must:	(b)(1)(ii)	The term "electronic storage media" means any digital storage medium or system that:
(f)(2)(ii)(A)	Preserve the records exclusively in a non-rewriteable, non-erasable format;	(b)(1)(ii)(A)	Preserves the records exclusively in a non-rewritable, non-erasable format;
(f)(2)(ii)(B)	Verify automatically the quality and accuracy of the storage media recording process;	(b)(1)(ii)(B)	Verifies automatically the quality and accuracy of the storage media recording process;
(f)(2)(ii)(C)	Serialize the original and, if applicable, duplicate units of storage media, and time-date for the required period of retention the information placed on such electronic storage media; and	(b)(1)(ii)(C)	Serializes the original and, if applicable, duplicate units of storage media and creates a time-date record for the required period of retention for the information placed on such electronic storage media; and

The following requirements reflect the most recent updates to SEC 17a-4(f)(3)(iii) and CFTC 1.31(b)(2)(iv).

SEC 17a-4 Requirement		CFTC 1.31 Requirement	
(f)(3)	If a member, broker, or dealer uses micrographic media or electronic storage media, it shall:	(b)(2)	Persons who use either micrographic media or electronic storage media to maintain records in accordance with this section must:
(f)(3)(iii)	Store separately from the original, a duplicate copy of the record stored on any medium acceptable under § 240.17a–4 for the time required.	(b)(2)(iv)	Store a duplicate of the record, in any medium acceptable under this regulation, at a location separate from the original for the period of time required for maintenance of the original; and

The following requirements reflect the most recent updates to SEC 17a-4(f)(3)(v) and CFTC 1.31(b)(3)(ii).

SEC 17a-4 Requirement		CFTC 1.31 Requirement	
(f)(3)(v)	The member, broker, or dealer must have in place an audit system providing for accountability regarding inputting of records required to be maintained and preserved pursuant to §§ 240.17a–3 and 240.17a–4 to electronic storage media and inputting of any changes made to every original and duplicate record maintained and preserved thereby.	(b)(3)(ii)	Develop and maintain written operational procedures and controls (an "audit system") designed to provide accountability over both the initial entry of required records to the electronic storage media and the entry of each change made to any original or duplicate record maintained on the electronic storage media such that:
(f)(3)(v)(A)	At all times, a member, broker, or dealer must be able to have the results of such audit system available for examination by the staffs of the Commission and the self-regulatory organizations of which the broker or dealer is a member.	(b)(3)(ii)(A)	The results of such audit system are available at all times for immediate examination by representatives of the Commission or the Department of Justice;
(f)(3)(v)(B)	The audit results must be preserved for the time required for the audited records.	(b)(3)(ii)(B)	The results of such audit system are preserved for the time period required for the records maintained on the electronic storage media; and

About Cohasset Associates, Inc.

Cohasset Associates, Inc. (www.cohasset.com) is one of the nation's foremost management consulting firms specializing in records management and information governance. Spanning 40 years and serving both domestic and international clients, Cohasset provides award-winning professional services in four areas: management consulting, education, thought-leadership and legal research.

Management Consulting: Working with multi-national clients, Cohasset develops effective records and information management programs that promote interdisciplinary governance. Cohasset also engages in implementation activities to achieve business goals, improve compliance and mitigate risk. Distinguished as a leader of the transition from records management to information governance, Cohasset held its first Managing Electronic Records (MER) Conference in 1993. Cohasset's current and former clients include several winners of ARMA's prized Cobalt Award. Cohasset is proud of its reputation for attaining exceptional results.

Education: Cohasset is renowned for its longstanding commitment to education on information governance and records and information lifecycle management.

> *For domestic and international clients, Cohasset:*
> - *Formulates information governance implementation strategies*
> - *Develops policies and standards for records management and information governance*
> - *Creates clear and streamlined retention schedules*
> - *Prepares training and communications for executives, the RIM network and all employees*
> - *Leverages content analytics to improve lifecycle controls for large volumes of eligible information, enabling clients to classify information, separate high-value information and delete unneeded information*
> - *Designs and assists with the implementation of information lifecycle practices that avoid the cost and risk associated with over-retention*
> - *Defines technical and functional requirements and assists with the deployment of enterprise content management and collaboration tools*

Thought-Leadership: Cohasset regularly publishes thought-leadership white papers and surveys to promote continuous improvement in the lifecycle management of information.

Legal Research: Cohasset is nationally respected for its direction on records and information management legal issues – from retention schedules to compliance with regulatory requirements associated with the use of electronic or digital storage media.

Cohasset has been described as *the only management consulting firm in its field with its feet in the trenches and its eye on the horizon*. It is this blend of practical experience and a clear vision of the future, which, combined with its commitment to excellence, has resulted in Cohasset's extraordinary record of accomplishments and innovation.