February 19, 2021

Division of Dockets Management (HFA–305)
Food and Drug Administration,
5630 Fishers Lane, Rm. 1061
Rockville, MD 20852

Re: **Initial Comments** of AIM North America on:
**Docket No. FDA-2014-N-0053**
**Requirements for Additional Traceability Records for Certain Foods**
Federal Register, Volume 85, Number 185, pages 59984-60038

To Whom It May Concern:

We are pleased to submit the enclosed comments regarding the above referenced docket and regulatory information number which appeared in Federal Register, Volume 84, Number 181, pages 49111 – 49114.

These comments were prepared by members of the AIM North America Food Safety Committee, all of whom are subject matter experts of the design and application on automatic identification technology. Founded in 1970, AIM is an industry trade association that represents the providers and users of technologies, systems, and services that capture, manage, and integrate accurate data into larger information systems that improve processes enterprise-wide. AIM North America is a chapter of AIM, Inc. In this role we advocate, educate, and coordinate with other subject matters experts including the FDA, GS1, MHI, AIAG to further the adoption of AIDC usage in industry.

AIM serves as the secretariat for the U.S. Technical Advisory Group (TAG) ISO/IEC JTC 1/SC 31 | Automatic Identification and Data Capture Techniques. This group formulates the U.S. position on all work related to the standardization of data formats, data syntax, data structures, data encoding, and technologies for the process of automatic identification and data capture and of associated devices utilized in inter-industry applications and international business interchanges and for mobile applications.

AIM North America appreciates this opportunity to submit comments in response to the Food and Drug Administration's (FDA) Notice in the above-captioned docket, seeking comment on the agency's approach to Requirements for Additional Traceability Records for Certain Foods

As subject matter experts in asset tracking technologies including Barcodes (1D & 2D Symbols), Radio Frequency Identification (RFID), Real Time Location System (RTLS), Internet of Things (IoT), and other technologies. AIM North America will be happy to respond to any technical support requests from the FDA about the value of standards or the implementation of the rule.

Sincerely yours,

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INTRODUCTION AND SUMMARY

AIM North America, as an industry recognized advocate for standards development and advocacy of AIDC technologies appreciates this opportunity to submit comments in response to the Food and Drug Administration's (FDA) Notice Requirements for Additional Traceability Records for Certain Foods, Docket No. FDA-2014-N-0053 or otherwise known as section 204 of the Food Safety Modernization Act.

AIM North America applauds the FDA's development and education advocacy around the Requirements for Additional Traceability Records for Certain Foods. It was a monumental endeavor to develop a proposed regulation for an industry as broad as the food supply chain which encompasses small to large scale enterprises conducting business globally in remarkably diverse locations.

AIM serves as the secretariat for the ISO U.S. Technical Advisory Group (TAG) ISO/IEC JTC 1/SC 31 | and is adept at writing standards for the Data Capture industry. AIM North America is a recognized voice for AIDC providing testimony before Congress and collaborating closely with the FDA during the implementation of Unique Device Identification System Rule of 2013 and the Drug Supply Chain Security Act (DSCSA) of 2013. AIM North America is pleased to have this opportunity to provide comments on this important rule.

AIM North America is part of a global network dedicated to developing interoperable technical guidance and ISO standards, we support the collaborative standards development process. We request that the FDA consider the following points when drafting the final rule, additional details for each point can be found in the following sections below.

1) Leverage what exists. The FDA has successfully partnered with consensus-based standards groups for the implementation of the 2013 legislation for UDI and DSCSA. In the aforementioned rules the FDA leveraged the technical community and existing consensus-built standards to drive successful adoption.
2) Focus on the fundamentals of supply chain visibility: Globally Unique Identifier contained in a Data Carrier (i.e. 2D Barcode, RFID, NFC, digital watermark, etc.) attached to item and captured automatically at defined points (i.e. Commission, Receiving, Shipping, Transformation, Consumption) with an agreed upon set of attributes.
3) Focus on permissioned access to data throughout the supply chain to end consumers. AIDC can enable trusted secure access to data through standards such as the GS1 Digital Link and ISO/IEC 20248:2018 Digital Signature Meat Data Structure.
4) Terms – AIM North America concurs with the importance of aligning on definitions for commonly used terms to promote the common understanding. However, AIM North America strongly advises aligning with common definitions defined by consensus-based standards groups to minimize misunderstandings and promote a common understanding. Examples include - Traceability Lot, Traceability Lot Code Generator,
5) Food Traceability List clarification - The FDA Risk-Ranking Model for Food Tracing ("the Model"), is the document that lists the food items of concern, while outside of AIM North America's area of expertise, we have notations concerning it.
6) Clearly defining product recall. This can be used as a guidepost for supply chain members, industry organizations and solution providers for implementation. FDA has provided a template for the response from industry to the FDA but not what the FDA will send to industry.

COMMENTS

Increasingly globalized, complex supply chains have resulted in less visibility into food sourcing for customers and regulators. These trends are driving the need for digital transformation through the adoption of technology to bring automation, integrity, and data management solutions to supply chain traceability. Digital technology can enhance the ability to identify, respond to, and prevent food safety issues such as outbreaks. Given recent food incidents, the use of digital technology has become even more needed, as it can help to make full product data accessible throughout every stage of the food supply chain in the event of a recall.

Currently this level of sophistication is not reflected in the relevant global standards. When performing a survey of ISO Food Standards as well as other standardization groups one finds the following as an example of the current requirements: ISO 22005:2007 (confirmed 2016) Traceability in the feed and food chain defines, "Traceability systems should be able to document the history of the product and/or locate a product in the feed and food chain. Traceability systems contribute to the search for the cause of nonconformity and the ability to withdraw and/or recall products if necessary. Traceability systems can improve appropriate use and reliability of information, effectiveness and productivity of the organization."

While sound advice, this statement does not provide the technical basis needed to build a ubiquitous, transparent interoperable food traceability system. ISO 22000 Food Management Systems, HarmonizedGap, Codex all contain a similar level of detail.

Conversely, the GS1 has had a working standard for the last decade – has a proven set of attributes but has not been widely adopted but has been demonstrated effective in other supply chains such as the Drug Supply Chain Security Act.

1. Leverage what exists.

   Prior successes of the FDA traceability rules included collaborating with consensus-based standards groups.

   a. UDI - The U.S. Food and Drug Administration (FDA) established a national unique device identification system to adequately identify medical devices through their distribution and use. Once implemented, the label of most devices included a unique device identifier (UDI) in human- and machine-readable form. Device labelers must also submit certain information about each device to the FDA administered Global Unique Device Identification Database (GUDID). The database, serves as a reference catalog of information about every device with an identifier, is publicly accessible to allow all stakeholders— provider systems, payers, clinicians, patients, industry, FDA and others— to search, download, and use information in the GUDID. The UDI system, which was phased in over several years and represented a landmark step towards improving patient safety, modernizing device post-market surveillance. The success of this program depended upon the collaboration of AIM North America, GS1 US, UDI Coalition, Vendors, and Regulators, a great example of consensus-based standards providing a framework of adoption. AIM North America served as a technical resource for the community and submitted questions from the FDA for several years.

b. DSCSA - The Drug Quality and Security Act (DQSA), was enacted by Congress on November 27, 2013. Title II of DQSA, the Drug Supply Chain Security Act (DSCSA), outlines steps to build an electronic, interoperable system to identify and trace certain prescription drugs as they are distributed in the United States. This legislation is currently on the pathway to full adoption in November 2023. By the end of 2023, the entire supply chain must be DSCSA compliant. Complete unit-level traceability, including aggregation, will be mandatory. Once again consensus-based standards relying on globally unique identification being attached in a data carrier to items being captured at critical points along the supply chain formed the basis of this electronic, interoperability supply chain. In addition, there will be cross pollination of pharmaceutical and food supply chains meeting at Retail Grocery Operators driving the need for consistent standards adoption.

We encourage the FDA to consider these successful implementations above in the food supply chain. Relying on global, interoperable consensus-based standards is foundational for the success of this proposed rule.

2. The foundational concepts in traceability for any supply chain: Globally Unique Digital Identifier attached to a physical item and with an agreed upon set of capture points with defined attributes collected in a standard format. Define the common points so when we connect the dots required for electronic traceability the data will be interoperable.

   AIM North America recognizes that a single method for collecting all food supply chain data or a single repository for holding and sharing such information is neither feasible nor desirable and applauds the FDA decision to not require one. However, AIM North America encourages the FDA to move closer to requiring interoperability that enables global understanding of the data. AIM North America believes interoperability is best enabled with FDA-backed global ISO based consensus-built standards for both physical and digital identities to facilitate a system that allows supply chain participants flexibility of approach in capturing and sharing supply chain content that is universally recognized by others in the supply chain. Such standards must support and encourage the use of globally unique identities in a data carrier, automated data collection and is designed to last by facilitating the adoption of emerging AIDC technologies. Given the diversity that exists in the food supply chain, interoperability is necessary for achieving scalability, lowering adoption costs, and preventing the exclusion or elimination of smaller supply chain participants.

   In the Nov 11, 2016 FDA report to congress the following gaps were identified in the Institute of Food Technologist pilots:

   - Lack of coverage of all establishments (e.g., farms and restaurants are excluded) - FDA has corrected in proposed rule for Additional Traceability Records by outline requirements for these facilities.
   - Lack of uniform data and record requirements – FDA has identified what points they want to capture – next step is to align on common data attributes and definitions.
   - Inability to link incoming with outgoing product within a firm and from one point in the supply chain to the next - FDA has addressed.
   - Inadequate mechanisms to rapidly capture, receive, and analyze tracing information (electronic and technology applications). - FDA has not addressed.

The FDA should adopt standards to set the baseline content and data points needed to facilitate a food supply chain that is both visible and actionable. These standards should require such baseline content to be physically tied to each end-consumption item entering the food supply chain in a manner that can be digitally captured. By establishing universal baseline requirements, each supply chain participant should be able to collect and share the same information (e.g. unique identifier, lot/batch, date, etc.) regardless of the technology or platform used.

It is our understanding the FDA needs to be technology agnostic; the optimal method for this is to have a common language – keep-it-simple principle will facilitate adoption. The proposed rule has the intent of enabling technology from spreadsheets to blockchains to span the technology capabilities of businesses. This may be a critical step ensuring the smooth implementation of the law and progression towards electronic traceability. However, defining a strong taxonomy and adhering to current standards does not enable a technology divide but rather a strong base that enables future digitization by ensuring that technology investments are durable.

ISO/IEC 19987, ISO/IEC 19988 are the accepted global definition for event descriptions and are the GS1 peer reviewed Electronic Product Code Information Services (EPCIS) and Core Business Vocabulary (CBV) standards. EPCIS is a GS1 standard that enables trading partners to share information about the physical movement and status of products as they travel throughout the supply chain – from business to business and ultimately to consumers. EPCIS data consists of "visibility events," each of which is the record of the completion of a specific business process step acting upon one or more objects. EPCIS does not define a storage mechanism, one is free to use a spreadsheet, database or blockchain. AIM North America strongly recommends to the FDA that they consider incorporating these widely adopted consensus-based standards.

The goal of EPCIS is to enable disparate applications to create and share visibility event data, both within and across enterprises. This sharing is aimed at enabling users to gain a shared view of physical or digital objects within a relevant business context.

The GS1 standards are globally reviewed and then undergo an additional review when the corresponding ISO standard is updated. AIM North America strongly encourages the FDA to adhere to these standards and resist from developing new terms. As stated previously, EPCIS does not prevent the use of a spreadsheet as a storage mechanism, AIM North America believes EPCIS brings alignment with currently accepted taxonomy and will enable more rapid adoption of new traceability requirements.

The guiding principle for widely adopted standards is clarity and simplicity. The FDA examples are clear, however AIM North America believes the creation of new Critical Tracking Events when industry definitions exist and are used in the FDA Drug Supply Chain Security Act and the FDA Unique Device Identification Act adds unnecessary complexity and confusion to implementations.

The FDA defines the following critical tracking events:

- Growing & Creating - The current FTL, (Food Traceability List published by the FDA), encompasses leafy greens, cheeses, finfish, nut butters and deli salads. In the future with coordination with the USDA this list could include proteins and other USDA regulated foods.

Growing in the current legislation refers to farms and aquafarms (either farmed or fresh caught) with specific information required for sprouts. Creation refers to the initiation of a food product that is on the FTL made wholly or partially from ingredients not on the FTL.

Per the ISO/IEC 19987, ISO/IEC 19988 standards this Critical Tracking Event (CTE) would be known as commissioning. When ensuring user community alignment, simply because a term is not familiar doesn't mean it is the wrong term. The assignment of a globally unique identity to an item either at lot or each level sufficient for traceability through the supply chain.

- Receiving and First Receiving - While AIM North America recognizes the intent of First Receiver the identification of first receiver in the supply chain may not always be evident and this distinction could add confusion to the process. AIM North America strongly recommends identifying the need for two different classification of receivers. There are also dependencies across supply chain for supply chain partners to exchange information with no field definition which will lead to incompatibilities. For instance, if I define my product identifier + batch/lot number as a 40-digit number and you define as a 60-digit alphanumeric number, I may not be able to capture and store your number due to system limitations.

- Transforming - This event was well defined encompassing norms within industry standards.

- Shipping and 1st Shipper Food - The FDA does not designate a First Shipper event but clearly a match to the First Receiving event will need to occur. The FDA designates several key data elements that must be sent with the shipment. To ensure that the receiver can correctly interpret and utilize the data it is necessary to have a common language.

In the proposed rule the FDA has created additional visibility events mainly to account for opaque parts of the supply chain; they include 1st Receiver and Created Item. First receiver is responsible for capturing pertinent information from the farm or fishing vessel. A Created item consists of some or all items not on the food traceability list. We encourage the FDA to consider the following copied Paragraph 204 (c) of the Food Safety Modernization Act which states that a, "*Product Tracing System shall be created. The Secretary, in consultation with the Secretary of Agriculture, shall, as appropriate, establish within the Food and Drug Administration a product tracing system to receive information that improves the capacity of the Secretary to effectively and rapidly track and trace food that is in the United States or offered for import into the United States. Prior to the establishment of such a product tracing system, the Secretary shall examine the results of applicable pilot projects and shall ensure that the activities of such system are adequately supported by the results of such pilot projects."*

In pursuant to this paragraph in addition to paragraph 204 (d) Additional Recordkeeping Requirements for High-Risk Foods. AIM North America recommends that the FDA follows traceability principles of attaching a globally unique identifier to an item when it is "born" or created, from any agricultural or manufacturing process which will reduce or eliminate the opaque parts of the supply chain and the corresponding need to account for them.

3. Definition of Terms -

   Building a common language is a key component that enables standard adoption, some of the terms defined do not seem aligned with industry definitions. AIM North America recommends adopting ISO/IEC 19987, ISO/IEC 19988. ISO/IEC 15418. W3C Schema.org Global Data Model as well as any existing standardized code lists including IS0 639-1, ISO 3166-1 and -2, ISO 4217. The FDA should consider using consensus-built standards whenever possible to promote common global understanding.

   AIM North America would like to call attention to the following specific terms for the FDA to review or merge with existing taxonomy.

   a. Traceability Lot – Recommend adopting the more familiar Batch/Lot definition and taxonomy.
   b. Traceability Lot Code Generator – FDA appears to be putting emphasis on intelligent assignment of numbers in the traceability lot number. For organizations which use this as a random number the lot code generator could be superfluous.
   c. Location Identifier – Could encompass GS1 Global Location Number however the definition limits itself to calling out fishing vessel ids or other reference systems. Recommend to expand it to referencing body's GLNs. The GLN has wide global acceptance due in part to endorsement from the FAO. AIM North America recommends that the FDA notes this consensus-built standard and encourages adoption.
   d. Growing Coordinates – Per the GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE PERFORMANCE STANDARD released April 2020 by gps.gov, GPS coordinates are accurate to within 5 meters (3 meters longitude and 5 meters latitude).
   e. Kill Step – A consolidated list of verified processes validating that the preventive controls identified and implemented in accordance with§ 507.34 are adequate to control the hazard as appropriate to the nature of the preventive control and its role in the facility's food safety system (21 CFR 507.47). Kill steps may be familiar to food safety personnel and those trained in HACCP but for storage and transportation. A consolidated list of approved kills steps would prove valuable.

4. Food Traceability List -

   FTL list - AIM North America members are mainly of a technical nature dealing with data carriers, data capture and data utilization. The FDA Risk-Ranking Model for Food Tracing ("the Model"), is the document that defines the process of designating a Food Traceability List and is outside of our core competence. We noted the following areas requiring clarification.

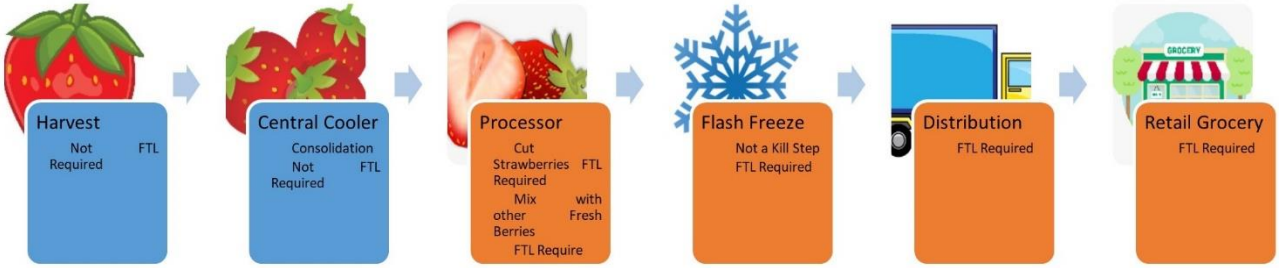
   a. Specify the frequency of review of the list. We recommend annually or through a request process initiated by industry, regulators, or public health officials.
   b. In the advent that a food from a new classification is promoted to the list we question whether one year of enforcement is sufficient time for the community to adopt traceability if no prior systems are in place.

With the FTL the FDA is merging the Food Safety community, Material Handling and the Technology Communities creating a shared understanding of food moving through the supply chain. To promote this common understanding, AIM North America recommends creating simple, accessible tools that can provide the community with timely answers or simplify the process so people can better understand it.

As written, there will be confusion around promoting items on and off the FTL as they move through the supply chain. The identification of a "kill step" seems to be a reasonable embodiment considering that the goal of the proposed rule is to reduce the instance of foodborne illness in the United States of America. However, because of the complexity in the food supply chain this can be confusing to supply chain members as food products can move onto and off the list as they travel through the supply chain.

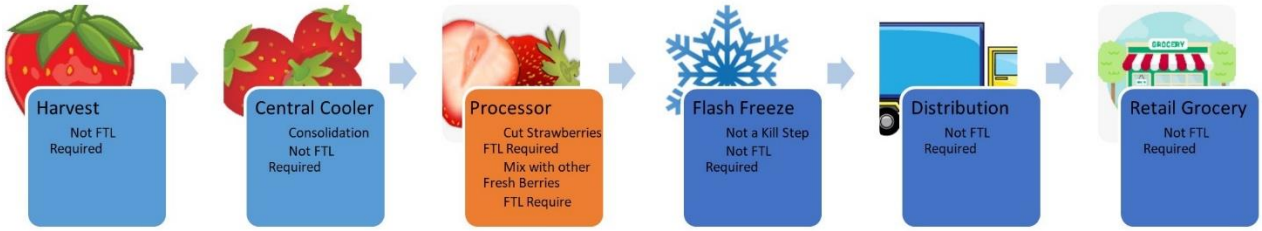
We will examine this complexity with a simple example, creating a bag of frozen, mixed berries including cut strawberries, cherries, and blueberries which was submitted to the FDA Technical Assistance Network (TAN) for clarification. The strawberries were sliced prior to being added to the assortment. Even though sliced strawberries are on the FTL it was not clear how this designation impacted the required record collection.

**Original Assumption for required traceability for cut strawberries.**




Assumption – Strawberries when harvested has no required data, Strawberries are transported to a central cooler, comingled, and shipped to a processor with no traceability records required. When the strawberries are sliced, they become a created product and require traceability records. The strawberries are mixed with other fruit, packaged and frozen. Since flash freeze was not on the consulted kill step list it was assumed records would be required to retail grocery

**Response from FDA Technical Assistance Network**




Answer – Strawberries when harvested has no required data, Strawberries are transported to a central cooler, comingled, and shipped to a processor with no traceability records required. When the strawberries are sliced, they become a created product and require traceability records. The strawberries are mixed with other fruit, packaged and frozen. Frozen Strawberries are not on the FTL no further records are required.

Thank you for your inquiry. In the Proposed Rule, "Requirements for Additional Traceability Records for Certain Foods," freezing is not considered a kill step. However, there are situations where a frozen food was categorized separately within the risk-ranking model for food tracing that FDA used to designate the Food Traceability List (FTL).

> Note from the FDA – pitted cherry question – this will cause backlog at FDA or companies not realizing they are out of compliance.

Within that model, frozen fruit such as frozen strawberries are included in the commodity "Fruits (Frozen)," which is not included in the proposed FTL. (See Table A-2 in Appendix A of FDA's report, Methodological Approach to developing a Risk-Ranking Model for Food Tracing FSMA Section 204.) Because of this, once the fresh-cut strawberry is frozen, the food would not be on the FTL and subpart S records would not have to be maintained through the remainder of the supply chain.

In the scenario provided above, subpart S records would not be required until the strawberries are used to create (see proposed §1.1345) an FTL food (fresh-cut fruit). Subpart S records would have to be maintained and sent through the supply chain until the strawberries are frozen; at which point records would no longer be required because frozen fruits are not on the FTL.

Any food (such as a berry mixture) that contains fresh-cut strawberries as an ingredient would be subject to the proposed requirements because fresh-cut strawberries are on the FTL.

During transformation (see proposed § 1.1340) – such as when fresh-cut strawberries are combined with foods not on the FTL to make a berry mixture – records about the foods used in transformation would only be required for the incoming ingredients that are on the FTL.

5. Clearly defined protocol for product recall –

   In the event of a food safety incident the data most likely available will be shopper data. However, for other points in the traceback and trace forward the data that will be provided by the recalling agency i.e. Brand, Location, Item Number, Batch/Lot or Date and how is this data going to be transmitted to retailers, foodservice and/or suppliers. This information is required for the industry for implementation of this regulation, but this piece seems to be missing. The FDA is clear on the spreadsheet that they will require it within 24 hours, however, no mention of the data that will be provided to start this request. This information will provide a guidepost for the community to work together through consensus-built standards to develop.

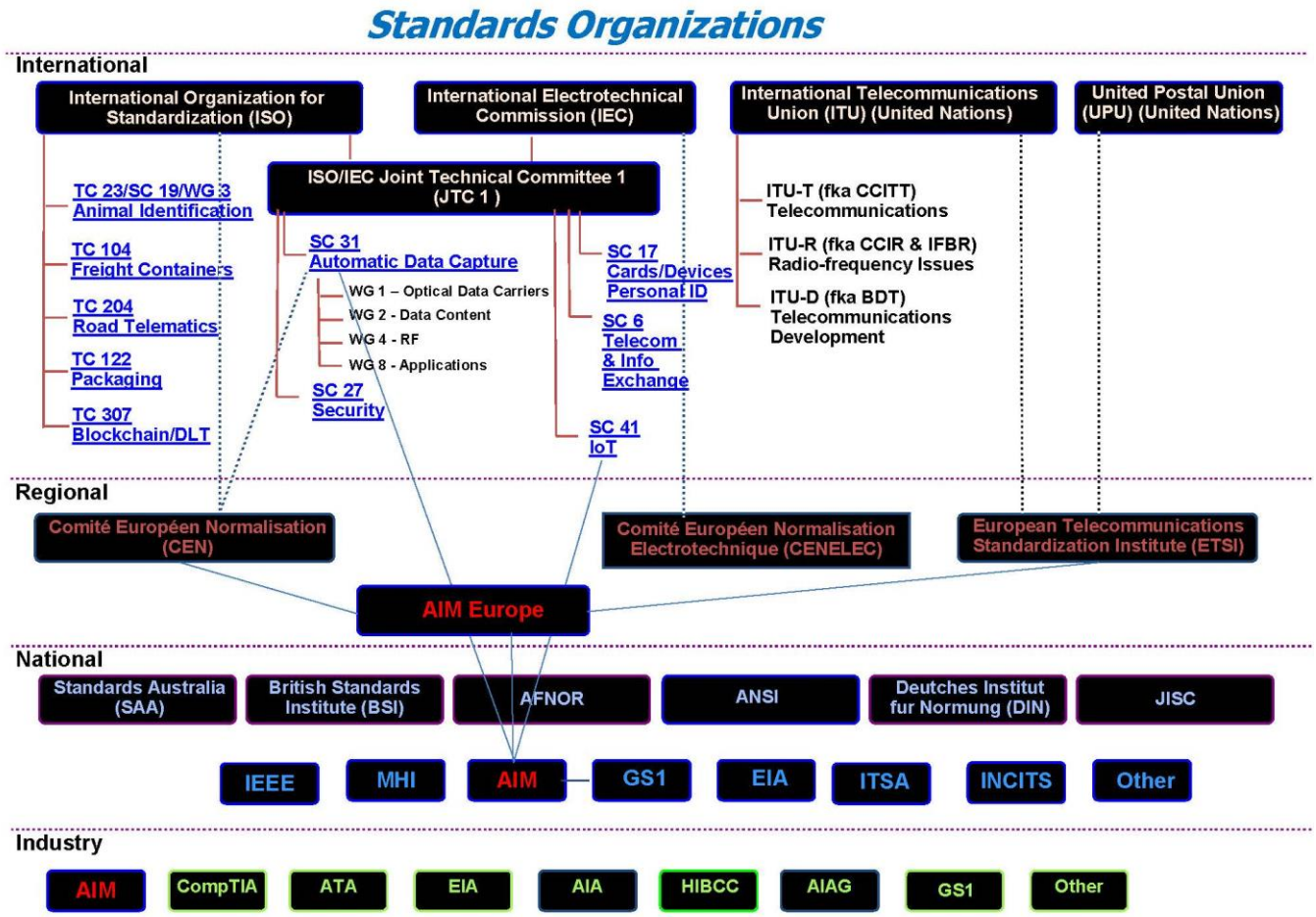
## CONCLUSION

The proposed rule on Requirements for Additional Traceability Records for Certain Foods is an excellent step on the part of the FDA to begin industry alignment establishing the necessary foundational components to harmonize the key data elements and critical tracking events needed for the enhanced traceability required to quickly implement source traceability, trace forward and implementing targeted recalls.

The FDA is taking the necessary first steps to identify the Critical Tracking Events and Key Data Elements necessary to ensure a rapid, efficient traceback and trace forward process. AIM North America encourages the FDA to consider our comments and rely on industry consortium standards as the underlying language required to enable global implementation.

AIM North America thanks the FDA for this effort, and for its consideration of our comments. If we can provide additional information or answer any questions, please do not hesitate to contact the undersigned.

# APPENDIX A


Standards Organizations
International
International Organization for Standardization (ISO)
International Electrotechnical Commission (IEC)
International Telecommunications Union (ITU) (United Nations)
United Postal Union (UPU) (United Nations)
TC 23/SC 19/WG 3 Animal Identification
TC 104 Freight Containers
TC 204 Road Telematics
TC 122 Packaging
TC 307 Blockchain/DLT
ISO/IEC Joint Technical Committee 1 (JTC 1 )
SC 31 Automatic Data Capture
WG 1 – Optical Data Carriers
WG 2 - Data Content
WG 4 - RF
WG 8 - Applications
SC 27 Security
SC 17 Cards/Devices Personal ID
SC 6 Telecom & Info Exchange
SC 41 IoT
ITU-T (fka CCITT) Telecommunications
ITU-R (fka CCIR & IFBR) Radio-frequency Issues
ITU-D (fka BDT) Telecommunications Development
Regional
Comité Européen Normalisation (CEN)
Comité Européen Normalisation Electrotechnique (CENELEC)
European Telecommunications Standardization Institute (ETSI)
AIM Europe
National
Standards Australia (SAA)
British Standards Institute (BSI)
AFNOR
ANSI
Deutches Institut fur Normung (DIN)
JISC
IEEE
MHI
AIM
GS1
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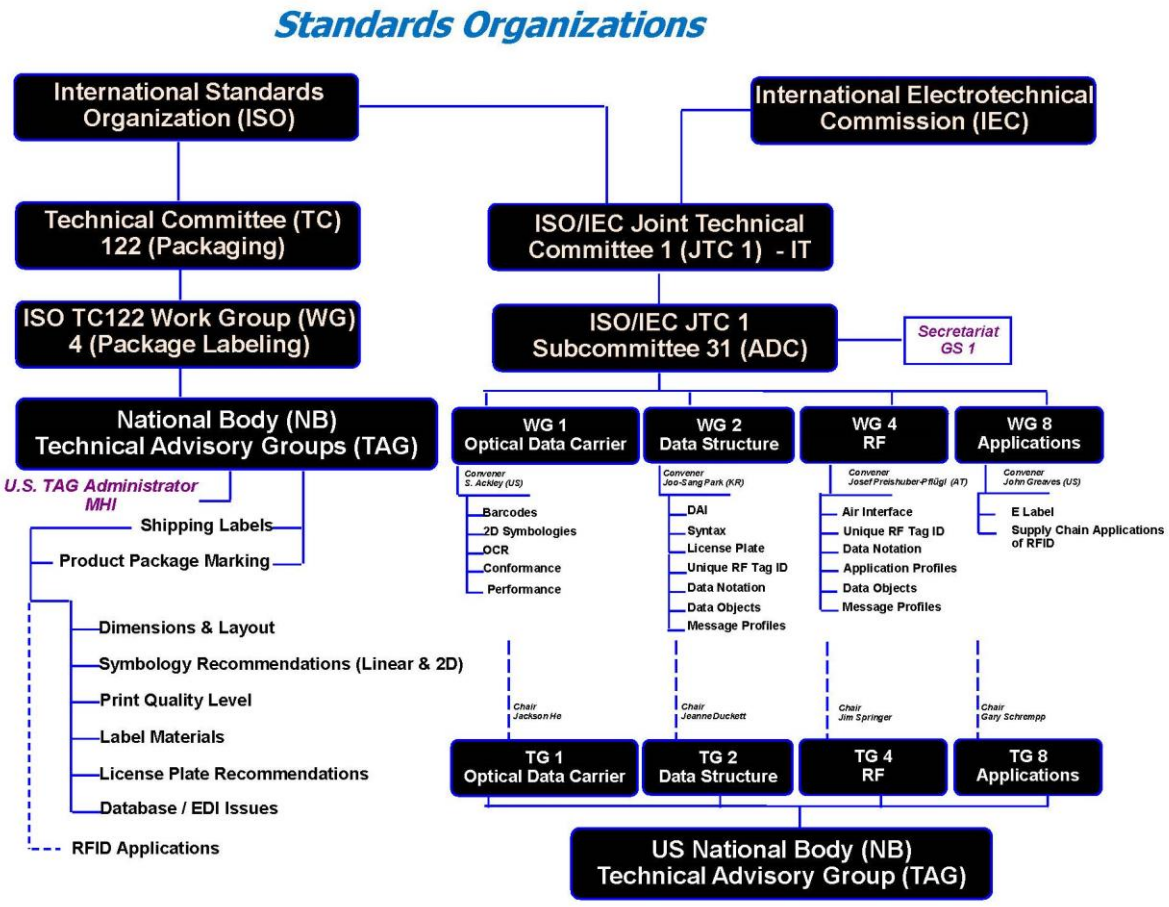
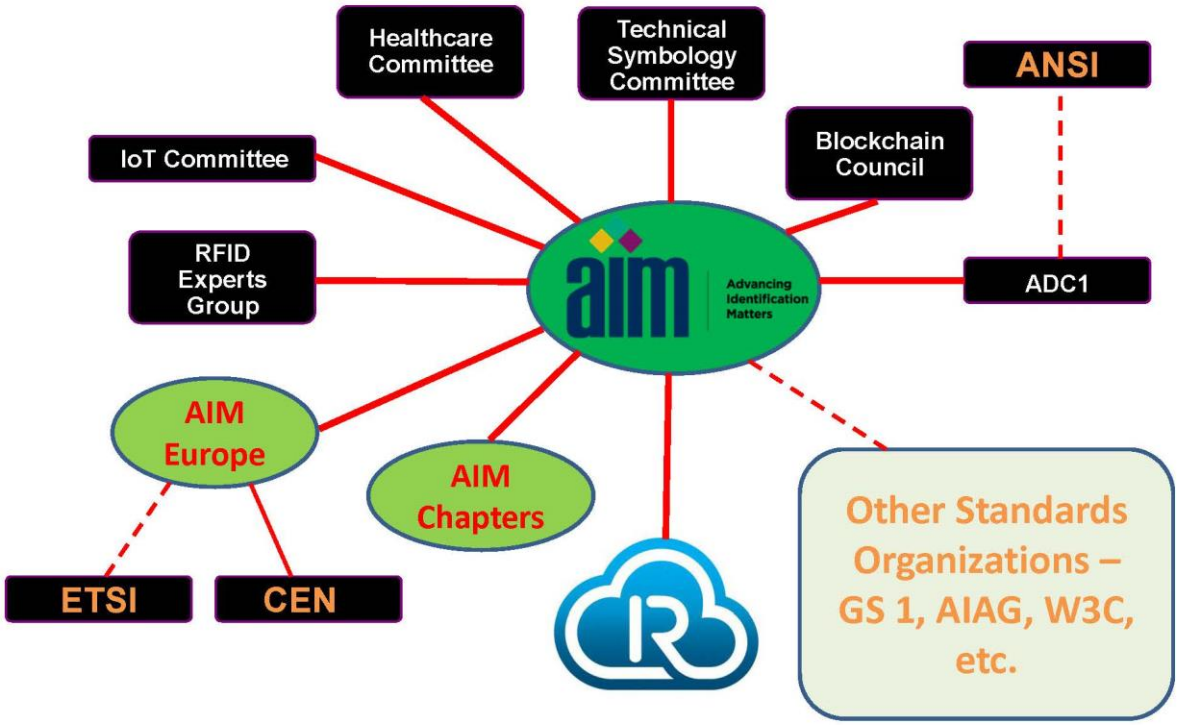
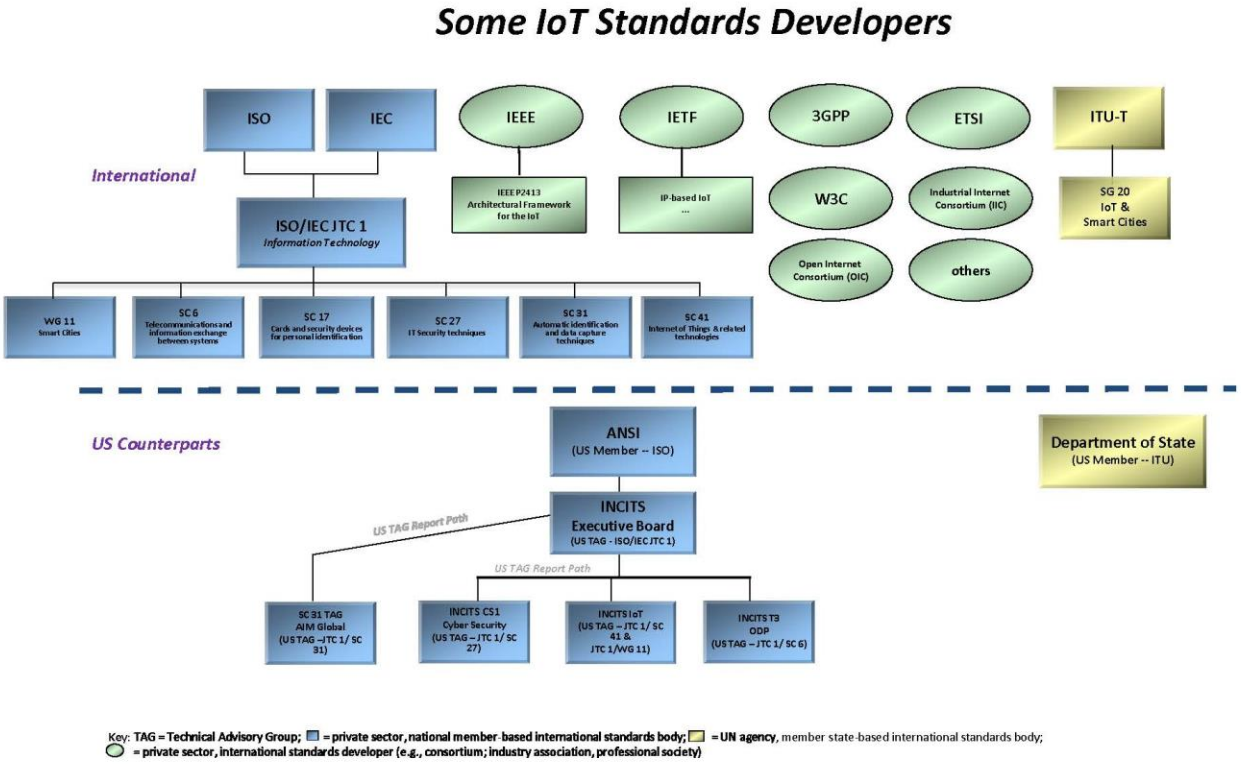
GS1
Other


Standards Organizations
International Standards Organization (ISO)
International Electrotechnical Commission (IEC)
Technical Committee (TC) 122 (Packaging)
ISO/IEC Joint Technical Committee 1 (JTC 1) - IT
ISO TC122 Work Group (WG) 4 (Package Labeling)
ISO/IEC JTC 1 Subcommittee 31 (ADC)
Secretariat GS 1
National Body (NB) Technical Advisory Groups (TAG)
WG 1 Optical Data Carrier
WG 2 Data Structure
WG 4 RF
WG 8 Applications
Convener S. Ackley (US)
Convener Joo-Sang Park (KR)
Convener Josef Preishuber-Pflügl (AT)
Convener John Greaves (US)
U.S. TAG Administrator MHI
Barcodes
2D Symbologies
OCR
Conformance
Performance
DAI
Syntax
License Plate
Unique RF Tag ID
Data Notation
Data Objects
Message Profiles
Air Interface
Unique RF Tag ID
Data Notation
Application Profiles
Data Objects
Message Profiles
E Label
Supply Chain Applications of RFID
Shipping Labels
Product Package Marking
Dimensions & Layout
Symbology Recommendations (Linear & 2D)
Print Quality Level
Label Materials
License Plate Recommendations
Database / EDI Issues
RFID Applications
Chair Jackson He
Chair Jeanne Duckett
Chair Jim Springer
Chair Gary Schrempp
TG 1 Optical Data Carrier
TG 2 Data Structure
TG 4 RF
TG 8 Applications
US National Body (NB) Technical Advisory Group (TAG)

## *AIM Relationships*



# Some Key IoT Standards Developers



## APPENDIX B

AIM Ultracode International Symbology Standard

AIM 7351731 Medical Electrical Equipment & Sys Electro Immunity Test for RFID Readers

AIM ISS DotCode Symbology Specification

Global Numeric Code Issuing Agencies in accordance with ISO 15459
https://www.aimglobal.org/uploads/1/2/4/5/124501539/register-iac-def_2019.pdf

ISO/IEC 15459-1:2014 Information Technology - Automatic Identification And Data Capture Techniques - Unique Identification - Part 1: Individual Transport Units

ISO/IEC 15459-2:2015 INFORMATION TECHNOLOGY — AUTOMATIC IDENTIFICATION AND DATA CAPTURE TECHNIQUES — UNIQUE IDENTIFICATION — PART 2: REGISTRATION PROCEDURES

ISO/IEC 15459-3:2014 Information technology — Automatic identification and data capture techniques — Unique identification — Part 3: Common rules

ISO/IEC 15459-4:2014 Information Technology - Automatic Identification And Data Capture Techniques - Unique Identification - Part 4: Individual Products And Product Packages

ISO/IEC 15459-5:2014 Information technology — Automatic identification and data capture techniques — Unique identification — Part 5: Individual returnable transport items (RTIs)

ISO/IEC 15459-6:2014 Information technology — Automatic identification and data capture techniques — Unique identification — Part 6: Groupings

ISO/IEC 15459-8:2009 Information technology — unique identifiers — Part 8: Grouping of transport units

**GS1/ ISO Standards list**

| ISO Standard | GS1 Component |
|---|---|
| ISO/IEC 15459-6 | GTIN (Global Trade Item Number |
| ISO/IEC 15459-4 | SGTIN (Serialized Global Trade Item Number |
| ISO/IEC 6523 | GLN (Global Location Number |
| ISO/IEC 15459-1 | SSCC (Serial Shipping Container Code |
| ISO/IEC 15459-4 & 5 | GIAI (Global Individual Asset Identifier |
| ISO/IEC 15459-5 | GRAI (Global Returnable Asset Identifier |
| ISO/IEC 15418 | GSRN (Global Service Relationship Number |
| ISO/IEC 15418 | GDTI (Global Document Type Identifier |

| | |
|---|---|
| ISO/IEC 15418 | GINC (Global Identification Number for Consignments |
| ISO/IEC 15459-6 | GSIN (Global Shipment Identification Number |
| ISO/IEC 15418 | GCN (Global Coupon Number |
| ISO/IEC 15418 | CPID (Component / Part Identifier |
| ISO/IEC 15418 | Application Identifiers |
| ISO 22274 | Global Product Classification (GPC |
| IETF RFC 3986 | EPC URI Syntax |
| ISO 9735 | EANCOM syntax |
| UN/CEFACT UNSMs | EANCOM content |
| W3C XML | GS1 XML syntax |
| W3C XML | GS1 XML content |
| ISO/IEC 15424 | Symbology identifiers |
| ISO/IEC 15420 | EAN/UPC |
| ISO/IEC 16390 | ITF-14 |
| ISO/IEC 15417 | GS1-128 |
| ISO/IEC 24724 | GS1 DataBar |
| ISO/IEC 16022 | GS1 DataMatrix |
| ISO/IEC 24723 | GS1 Composite |
| ISO/IEC 18004 | GS1 QR Code |
| ISO/IEC 18000-63 | UHF Class 1 Gen 2 /IEC 18000-63 |
| ISO/IEC 18000-3 | HF Class 1 Gen 2 |
| ISO/IEC 15962 | EPC Tag Data Standard |
| ISO/ICE 24791-5 | Low-level Reader Protocol (LLRP) |
| ISO/IEC 24791-2 | Application Level Events (ALE) |
| ISO/IEC 24791-3 | Reader Management (RM) |
| ISO/IEC 24791-3 | Discovery, Confguration, and Initialization (DCI) |
| ISO/IEC 19987 | EPC Information Services |
| ISO/IEC 19988 | GS1 Core Business Vocabulary (CBV) |