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WHITE PAPER

Serialization Implementation for DSCSA Compliance

SUMMARY

On November 27, 2013, the Drug Supply Chain Safety Act (DSCSA) was signed into law. This set forth verification requirements that took effect January 1, 2015 for manufacturers, wholesale distributors, dispensers, and re-packagers of certain drug products. The law aims to increase patient safety by minimizing risk from unauthorized pharmaceutical drug products entering the marketplace. The US Food and Drug Administration (FDA), charged with enforcing the DSCSA, set deadlines for compliance with this law. The law requires companies in the pharmaceutical supply chain to develop electronic systems designed to increase patient safety by minimizing drug diversion and reducing counterfeit products. The deadline November 27, 2017 was for Companies to comply or risk regulatory penalties. FDA published a draft guidance June 30, 2017 that delayed the deadline one year. This was expected and meant to provide adequate time for production and installation of hardware and software to achieve compliance. With that deadline now passed, FDA issued another draft guidance October 2018 to describe current interpretation of the DSCSA requirements.

The October 2018 guidance applies to the verification systems that manufacturers, wholesale distributors, dispensers, and re-packagers must have in place. It is intended to assist industry on what should be included in these systems for the determination, quarantine, and investigation of suspect products and the quarantine, notification, and disposition of illegitimate products. It also addresses recommendations that trading partners submit cleared product notifications, and the statutory requirements for verification, including verification of saleable returns, at the package level for product identifiers on packages and homogenous cases intended to be introduced in a transaction into commerce.

BACKGROUND

The US Centers for Disease Control and Prevention, FDA and other regulatory agencies began an investigation in September 2012 after an outbreak of meningitis in several states sickened over 800 people and resulted in the deaths of 84 individuals.[(1)] The cause was determined to be a Massachusetts compounding pharmacy that was illegally manufacturing pharmaceutical drug products and knowingly distributed mislabeled, contaminated and unsanitary products over several years. The circumstances resulted in action from Congress for new laws to closely track prescription drugs at each point in the pharmaceutical supply chain to reduce the risk of unauthorized products entering the marketplace. The DSCSA was signed into law by President Obama on November 27, 2013.

The DSCSA represent the greatest overhaul of the US pharmaceutical supply chain since the FDC Act of 1938[(2)]. Implementation of new and upgraded equipment, enhanced training and development programs and technology systems re-engineering affect the entire pharmaceutical supply chain and will fundamentally change the way companies conduct business[(3)]. The requirements and associated deadlines for DSCSA compliance demand a pro-active response from affected parties to implement the changes. Logistics services providers (LSP) must address issues related to their internal procedures while accommodating the various solutions being implemented on either side of the supply chain. On the LSP receiving side, pharmaceutical manufacturers require their 3PL partners to adapt to their

desired solutions. On the fulfillment side of the LSP, the three largest pharmaceutical wholesalers in the country demand that their trading partners follow their requirements in order to receive goods. Plans should include budgeting for the significant financial investment and human resources required to achieve compliance while maintaining operational efficiency. Third-Party Logistics (3PL) providers that also have active packaging lines, will need to make considerable investments in their packaging operations[4] , distribution centers, IT infrastructure, training and quality assurance to meet current and future DSCSA requirements. Their Quality Assurance and Regulatory Affairs Department will be deeply involved in training and documentation during this process.

THIRD-PARTY LOGISTICS PROVIDERS

The DSCSA,[5] requires development of an electronic system to verify legitimacy of pharmaceutical drug products down to the package level. It mandates compliance at several stages over ten years until full implementation in 2024. Drug manufacturers, wholesale drug distributors, re-packagers, dispensaries and 3PL pharmaceutical providers are affected. The initial process is known as serialization. By the end of 2018, manufacturers were to utilize a standardized method to individually identify the Smallest Salable Unit (SSU) available for purchase by authorized pharmacies or dispensers.

Serialization involves placing 2-D barcodes and a unique identifier containing product ID, serial number, expiration date and lot number on each SSU. Individual barcodes must be placed on standard shipping configurations including cases and pallets. By 2023, the technology, called Track and Trace, will be able to follow each bottle or package in the US and internationally back through the supply chain to the original manufacturer.

Smaller manufacturers are at a disadvantage compared to global players, and manufacturers with a limited number of products requiring serialization may choose to outsource the entire process compared with the significant capital investment required to achieve compliance themselves. Pharmaceutical manufacturers may utilize LSPs to receive and store drug products per regulatory guidelines and fulfill deliveries to authorized dispensers including hospitals, pharmacies and other healthcare providers. Additionally, the DSCSA regulations involve significant changes that manufacturers can transfer onto the shoulders of reputable partners.

IMPLEMENTATION STAGES

FDA is responsible for implementation and monitoring of the DSCSA. They examined the law and separated it into three phases[6]. Each phase addresses specific issues with specific completion dates. Although FDA continues to refine requirements, the three phases are guidelines currently followed by the pharmaceutical industry.

Phase I: Lot Level Management and FDA Registration. FDA required all 3PL providers to provide product tracing information on documents for outgoing shipments and register on the FDA portal by May 15, 2015. Some early DSCSA protocols included providing a paper packing slip and Advance Shipping Notice (ASN). Information was added to include expanded product details and clearly identify all parties involved in the transaction. A disclaimer was added to confirm the product was acquired legally and in compliance with DSCSA. The DSCSA-compliant ASN was also converted into digital format to be sent electronically.

Phase II: Item Serialization. When serialization is implemented, receiving, storing and fulfilling orders will change significantly for 3PL providers. The most significant changes will occur in the technology backbone to enable electronic communications within and between systems to allow for exchange of extensive data captured on new 2D barcodes. The Act states that manufacturers must put a unique product identifier on certain prescription drug packages and have a procedure for verification of product at the package level including the standardized numerical identifier, or NDC.

Companies should be careful of having a false sense of confidence by completing this single requirement and fully utilize the new 2D technology in warehousing, fulfillment and packaging and labeling operations. Current 1D barcodes use a single code in parallel lines to convey a limited amount of product information. With serialization, each pallet, case and bottle have their own unique 2D barcodes for improved tracking at every point in the supply chain. The 2D barcodes hold increased amount of data required to implement Track and Trace. Technology upgrades are designed to minimize procedural changes on the warehouse floor, however some of these practices will also be modified. The technology upgrades in hardware and software must accommodate a huge increase in data transfer and storage required by regulations and be flexible to securely communicate effectively with other systems. Companies will fully implement Phase II serialization with aggregation solutions in all warehouse facilities. Aggregation enables a single scan to capture the unique identifiers on each of the smallest salable units within a large shipment. Aggregation solutions are often undertaken during Phase II with Item Serialization programs.

Phase III: Serialized Item-Level Traceability. By November 2023, completed serialization programs will combine comprehensive information exchange[7] to mine, analyze and evaluate data on movement of pharmaceutical drug products to minimize counterfeit, diversion, manufacturing and supply chain issues. It will be illegal to buy, sell or handle products without product identifiers. Enhanced product tracing at the package level will be implemented[8]. FDA is expected to issue future details about architecture of enhanced product tracing system.

IMPLEMENTATION STRATEGY

For many companies, strategy involves five levels of technology. Level 1 involves the installation of new software on handheld devices in shipping and distribution. Level 2 involves hardware including printers, desktop device readers, cameras and scanners being upgraded or replaced on individual lines in Packaging and Labeling operations. Level 3 involves software programs required to control data, serial number management and aggregation on separate production lines. Level 3 involves installation of software governing all production lines in packaging operations. At Level 4, further software development is implemented incorporating the international GS1 standard. This programming controls connectivity throughout the company by interfacing with Warehouse Management Systems. At Level 5, systems are activated to integrate equipment and information technology assets with product tracing, verification and end-to-end serialization, also known as enterprise compliance.

TRADING PARTNERS

Manufacturers must ensure trading partners comply with DSCSA guidelines or risk penalties. Some Companies should consider that packaging and labeling vendors promising item serialization compliant facilities by the deadline may be delayed. Searching for alternative solutions from firms in compliance in advance of the deadline date are in the best interest of manufacturers to maintain supply chain integrity and uninterrupted distribution. This gap between current readiness and full compliance is causing some manufacturers to seek options to continue full operations post-deadline.

- Manufacturers with a limited number of products requiring DSCSA compliance may outsource the entire serialization process because the financial investment to meet compliance is too great. For companies with no serialization plans, they undertake the responsibility to convert their inventory into DSCSA-compliant products. The process involves setting up a Level 4 repository on the client's behalf. The repository acts as the solution to achieve serialization compliance. It gathers serial number generation requests from packaging lines and produces DSCSA-compliant serial numbers and related data. The repository handles exchange and transmission of serialized data aggregation, commission and shipping events between packaging and

distribution systems and manages communication between up- and downstream parties to verify transactions, check for saleable returns and recognize suspect products to minimize diversion and counterfeiting. Client products are then packaged and labeled with DSCSA-compliant barcodes on each unit, package and pallet. From the packaging line, products are moved to the on-site warehouse for storage as required where orders are fulfilled to downstream recipients.

- Manufacturers working with contract manufacturers (CMOs) that place compliant serial numbers on primary packaging should be aware that in some cases, the serial number is owned by the CMO not the brand owner. Clients who say their CMO can add serial numbers should know that brand owners enabling their CMO to add serial numbers to their product are letting go a degree of control over their product because the numbers are being generated by a 3rd party system. When products with DSCSA-compliant serial numbers are shipped, the serialization services team establishes a Level 4 repository on behalf of the client. The CMO that created the serial numbers transmits the information to the client repository. At that point, each serial number can be aggregated, and shipping transactions may be exchanged to upstream and downstream partners.
- Manufacturers auditing their CMOs to determine their serialization readiness are able to ship product from 'at-risk' facilities directly to other locations for compliant packaging, labeling, warehousing and fulfillment.

CONCLUSION

Pharmaceutical LSPs operate at a critical point between manufacturers and dispensers in the pharmaceutical supply chain. Movement of critically important products depends on comprehensive regulations created and administered by government and other regulatory authorities. The DSCSA is the reason for sweeping changes throughout the industry. Companies should take a pro-active and strategic approach to assure compliance with DSCSA requirements.

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