MALISKO ENGINEERING, INC.

Implementing Title 21 CFR Part 11 (Electronic Records ; Electronic Signatures) in Manufacturing

Presented by: Steve Malyszko, P.E. - President & CEO

ACP ThinManager presents

thindustrial13

The Industrial Visualization and Thin Client Management Conference

Agenda

- Introduction
- Who is Malisko Engineering?
- Title 21 CFR Part 11 Primary Sections
- Methods for Implementing Part 11 Sections
- Related Validation Documentation
- Questions

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Introduction

Steve Malyszko, Founder (1994), President & CEO

- 35 years experience in Manufacturing Automation
- Last 18+ years actively involved in CSV for process control
- Pharmaceutical, Nutritional and Life Science industries.
- Last 11 years many validated Systems included 21 CFR Part 11
  - Programming and Validation Support,
  - Validation Lead,
  - Author of Validation Master Plans, URSs, FRSs, DDSs, TPs, TMs, VSRs,
  - More recent implementations of Part 11 by Malisko have involved use of thin clients.

- Periodic Audits and Gap Analysis for CSV Compliance

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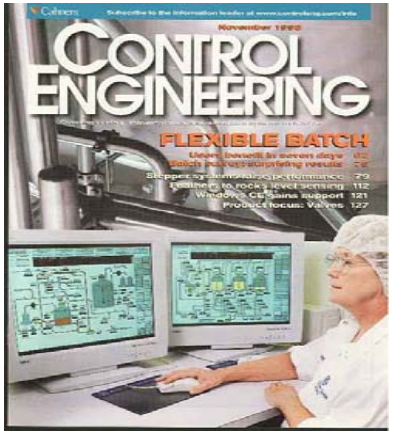
Who is Malisko Engineering?

- Experts in Manufacturing Automation and Validation
- Founded in 1994
- Headquartered in St. Louis, Missouri USA
- Regional Office in Denver, Colorado USA
  - Serving the Rocky Mountain Region, the Western United States, Canada and Mexico



CERTIFIED THINMANAGER INTEGRATOR PARTNER

Rockwell Automation Solution Partner
Control • Process • Information

Wonderware CERTIFIED SYSTEM INTEGRATOR SYSTEM PLATFORM

GE Intelligent Platforms Premier Solution Partner

OPTO 22 OptoPartner

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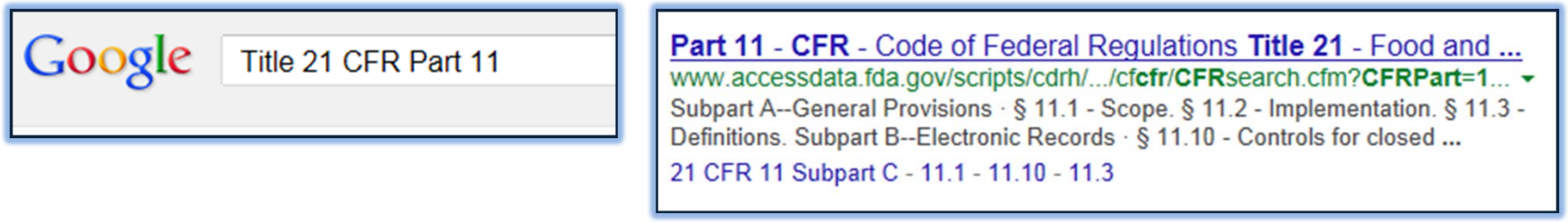
Title 21 CFR Part 11 Primary Sections



http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/cfrsearch.cfm?cfrpart=11

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Title 21 CFR Part 11 Primary Sections

- General Provisions –
  - Covers electronic records, electronic signatures, and handwritten signatures executed to electronic records to be **trustworthy, reliable**, and generally **equivalent to** paper records and handwritten signatures.
  - Applies to records in electronic form created, modified, maintained, archived, retrieved, or transmitted, under any agency regulations.
  - Computer systems (including hardware and software), controls, and documentation shall be readily available for, and subject to, FDA inspection.

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Title 21 CFR Part 11 Primary Sections

- General Provisions *(Continued)* –
  - Key Definitions –
    - ***Closed*** *system* - environment where system access is controlled by persons responsible for the content of electronic records on the system.

      - Examples are –
        - Email Software
        - Web Browsers
        - Microsoft Office
        - Most Computer-based Control and Data Systems in Manufacturing

    - ***Open*** *system* - environment where system access is ***not*** controlled by persons responsible for the content of electronic records on the system - ***Allows a user to access, manipulate, change/alter both the data and the underlying programming itself.***

      - Examples are –
        - WordPress publishing
        - Wikepedia
        - Unix O.S.
        - Excel Spreadsheets used for Reporting

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Title 21 CFR Part 11 Primary Sections

CLOSED SYSTEM

- Electronic Records –
  - Employ procedures and controls designed to ensure Record **authenticity** and **integrity**,
  - When appropriate, confidentiality of Records,
  - Ensure that signer cannot readily repudiate the signed Record as not genuine.
  - Additionally,
    - Validation of system(s)
    - Ensure accuracy, reliability, consistency
    - Ability to discern invalid or altered records
    - Generate accurate and complete copies of records in both human readable and electronic form
    - Protection of records to enable their accurate and ready retrieval
    - Limiting system access

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Title 21 CFR Part 11 Primary Sections

CLOSED SYSTEM

- Electronic Records –
  - Additionally *(Continued)* -
    - Use of secure, computer-generated, time-stamped audit trails for operator entries and actions that create, modify, or delete electronic records.
    - Record changes shall not obscure previously recorded information.
    - Use of operational system checks to enforce permitted sequencing of steps and events
    - Use of authority checks to ensure that only authorized individuals can use the system
    - Use of device (ie Thin Client) checks to determine validity of the source of data input

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Title 21 CFR Part 11 Primary Sections

CLOSED SYSTEM

- Electronic Records –
  - Additionally *(Continued)* -
    - Persons are trained who develop, maintain, use Electronic Record / Electronic Signature systems
    - Written policies in place for accountability and responsibility of individuals to deter falsification
    - Documentation controls covering distribution, revisions and change control procedures.

Title 21 CFR Part 11 Primary Sections

CLOSED SYSTEM

- Electronic Signatures –
  - General Requirements -
    - Each E-Sig shall be unique,
    - Organization shall verify the identity of individuals,
    - Certify E-Sigs as legally binding equivalent of handwritten signatures.
  - Non-Biometric E-Sigs -
    - At least two distinct identification components – UN and PW,
    - Used only by their genuine owners,
    - Ensure attempted use of individual's E-Sig by anyone other than its owner requires collaboration of two or more individuals.
  - Biometric E-Sigs -
    - designed to ensure that E-Sig cannot be used by anyone other than genuine owner.

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Title 21 CFR Part 11 Primary Sections

CLOSED SYSTEM

- Electronic Signatures –
  - Rules for **User Names** and **Passwords** -
    - Maintain uniqueness of each combined UN and PW,
    - UN and PW issuances are periodically checked, recalled, or revised (ie PW aging),
    - Have 'loss management' procedures to de-authorize lost, stolen, missing, or compromised tokens, cards, other devices bearing or generating UN and PW, and to issue replacements using suitable, rigorous controls,

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Title 21 CFR Part 11 Primary Sections

CLOSED SYSTEM

- Electronic Signatures –
  - Rules for **User Names** and **Passwords** *(Continued)* -
    - Use transaction safeguards to prevent unauthorized use of UNs and PWs,
    - detect and urgently report any attempts at unauthorized use of UNs and PWs,
    - Initial and periodic testing of devices for proper function and non-adulteration.

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Methods for Implementing Part 11 Sections

How Do I Make This Happen

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Methods for Implementing Part 11 Sections

EXAMPLES OF SUCCESSFULLY MEETING REQUIREMENTS -

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Methods for Implementing Part 11 Sections

Security

Employ Procedures & Controls designed to ensure the authenticity, integrity, and Confidentiality of Electronic Records.	Develop SOP's to support the use of Electronic Records in the Regulated Environment. Validate the Procedures and System. The validation should follow an established system life cycle (SLC) methodology – ie GAMP V (ISPE).
Limited system access to authorized individuals only.	Use Windows Security. Account Policies should implement password aging, minimum password length, password uniqueness, and account lockout after a reasonable number (5) of unsuccessful login attempts. Each Operator Node should be configured to use 'User Login' Timeout.

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Methods for Implementing Part 11 Sections

Electronic Records [ER's] / Electronic Signatures [ES's]

Generate accurate & complete copies of records in both Human-readable & Electronic format.	Records can be maintained in SQL and protected via System Security.
Protect records to enable their accurate and ready retrieval throughout the records retention period.	Develop SOP's to ensure that records are retained for an appropriate duration of time.
Use secure, computer-generated, time-stamped audit trails.	Use Microsoft Windows Clock Synchronization among all computers in the application.
Signed ER's shall contain information CLEARLY indicating – * printed name of the signer, * date and time when the signature was executed, * meaning of signature – ie → [review, approval, responsibility, authorship]. These requirements also apply to ANY human-readable form of the ER - both hardcopy printout and electronic display.	Audit Trail Records needs to include - - * Date & Time Stamp, * Node of Origination, * Operator Name, * Action Taken, * What Parameter [Tag Name] Acted Upon, * Message Type
ES's and Hand-Written Signatures executed to ER's shall be linked to their respective ER's in such a way to ensure that signatures cannot be excised, copied, or otherwise transferred to falsify an ER by ordinary means.	Develop SOP's to prevent unauthorized access to the Relational Database containing the Audit Trail File. Validate the Procedures and System.

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Methods for Implementing Part 11 Sections

S. O. P.'s for ER's / ES's

Establish, and adhere to, written policies that hold individuals accountable and responsible for actions initiated under their ES's in order to deter record and signature falsification.	Develop SOP's to support the use of ER's & ES's in the Regulated Environment. Validate the Policies and System.
Establish, and adhere to, written policies that (a) maintain the uniqueness of each combined identification code and password, (b) periodically checks, recalls, or revises ID code and password issuances, (c) follows loss management procedures to electronically de-authorize stolen, missing, or compromised tokens, cards, or other devices, (d) uses transaction safeguards to prevent unauthorized use of IDs & PWs, (e) conduct initial and periodic device testing.	Use current, robust SOP's (already in place via IT / IM Department) or Develop New SOP's to control the identification codes and passwords of individuals. Validate the Policies and System.

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Methods for Implementing Part 11 Sections

System Integrity & Trace Ability

	Use operational system checks to enforce permitted sequencing of steps and events.	Highly recommended to log ALL Parameter (Recipe) Downloads, Sequence Events, and Operator Actions in secure SQL database.
	Use device checks to determine the validity and integrity of the source of data input or operational instructions.	As part of the validation process, verify sources of data input, such as the Operator Stations [Thin Clients] Restrict Storage of Program Code, Recipe / Formula / Operating Procedures to a Secure Server Computer Environment – **Verify / Validate Both Physical and Electronic Access**
	Revision and Change Control Procedures to maintain an audit trail that documents time-sequenced developments and modifications of system documentation.	Typically covered by the IQ and OQ Validation Protocols and existing IT / IM Procedures.

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Methods for Implementing Part 11 Sections

Validation & Documentation

Validate the System to ensure accuracy, reliability, consistent intended performance, and the ability to discern invalid or altered records.	Develop and execute IQ and OQ Validation Protocols creating documented evidence of compliance with 21 CFR Part 11
Adequate controls over distribution of, access to, and use of documentation for system operation and maintenance.	Covered by the Validation Protocols referenced above

General

Establish, and adhere to, qualification criteria for persons who develop, maintain, or use the ER/ ES system. Education, training, and experience to perform their assigned tasks are considerations.	Covered by the Validation Protocols referenced above

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Related Validation Documentation

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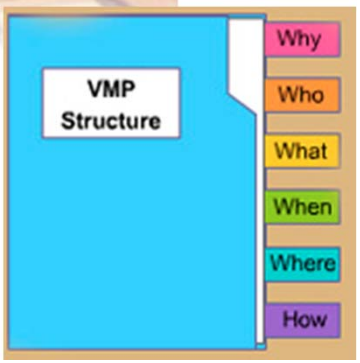
Related Validation Documentation

VALIDATION DELIVERABLES

- **Risk Assessment -**
  - Extent of validation (effort and documentation) considering -
    - Complexity of the system
    - Applicability and compliance with 21 CFR Part 11
    - Criticality of the system failure

- **Computer System Validation [Master] Plan (CSVP)**
  - Activities,
  - Overall responsibilities,
  - Documentation requirements for validation of the system.



- **User Requirements Specification (URS)**
  - Business,
  - Compliance (applicable regulations including 21 CFR Part 11),
  - Software and hardware constraints,
  - Functional requirements for the end user,
  - **Written in terms that are measurable and verifiable during testing.**

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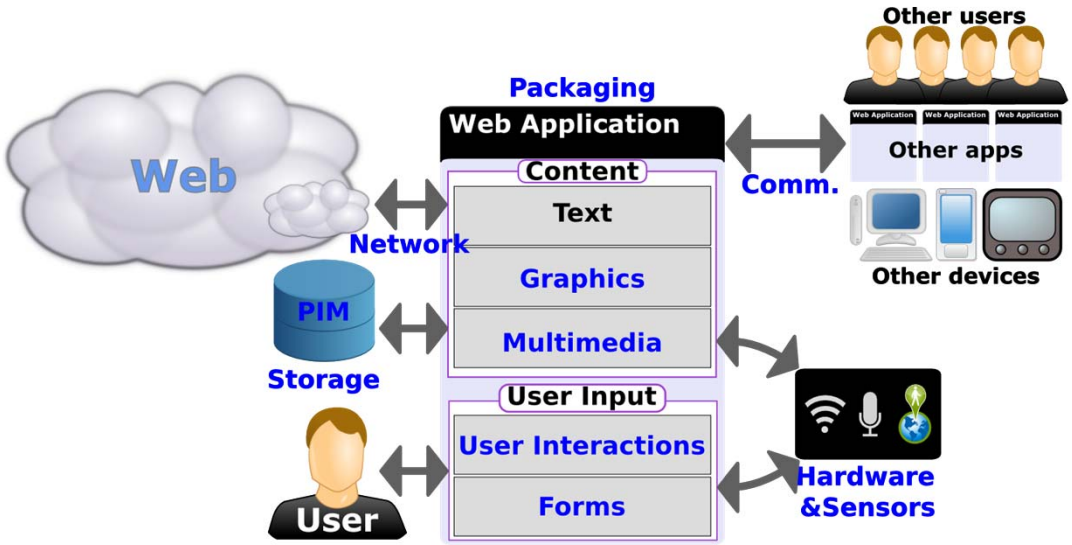
Related Validation Documentation

- **Functional Requirements Specification (FRS) -**
  - How the System is to operate both in NORMAL and ABNORMAL Situations.
  - Written in terms that are measurable and verifiable during testing.

- **Detailed Design Specification (DDS) -**
  - Required hardware,
  - Software,
    - Software versions,
    - Compatibility,
    - User interfaces,
    - Security,
    - Individual Modules,
    - Site-specific configuration,
    - Known vulnerabilities,
  - Configuration,
  - Support services
  - Written in terms that are measurable and verifiable during testing.



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Related Validation Documentation

- **Traceability Matrix -**
  - **Ensures all requirements are traced to the appropriate design elements (Input), are verified and tested (Output) showing all requirements have been met.**

Description	URS	FRS	DS	IQ	OQ
SCADA Operator Interface	7.1	7.1	16.0	5.4	6.2
Compounding Mimic Graphics Display	7.1.1	7.1.2 5.1.2.1	16.0	6.3.4, 7.1.4, 7.2.4	6.2.5
Mimic Graphics Displays for CIP Units #1, #12, #15, and #16	7.1.2	7.1.2 5.1.2.1	17.0	6.3.4, 7.1.4, 7.2.4	6.2.5.CI 1-144
Status Display of Digital/Discrete Devices	7.1.3	5.1.2.2	16.0	6.3.4, 7.1.4, 7.2.4	6.2.6
Status Display and Control of Hand-Off-Auto (HOA) Devices	7.1.4	5.1.2.2	16.0	6.3.4, 7.1.4, 7.2.4	6.2.11
Status Display of Analog Devices	7.1.5	7.1.1 7.1.2	16.0	6.3.4, 7.1.4, 7.2.4	6.2.9

- **Vendor Assessment**

- **Test Plan**
  - **How testing will be conducted to provide high level assurance that System successfully satisfies all requirements as defined in URS, FRS, and DDS.**
  - **Provides details of –**
    - **How testing will be conducted,**
    - **What is to be tested,**
    - **Roles and responsibilities of the participants,**
    - **How to handle deviations,**
    - **General instructions for the testers**
    - **Acceptance criteria for all testing.**

5. TESTING STRATEGY
6. TEST STANDARDS
   6.1. Executing Tests
   6.2. Documenting Test Execution
7. TEST DELIVERABLES
   7.1. Overview
   7.2. Development Testing
   7.3. Installation Qualification (IQ)
   7.4. IQ Protocol Testing Summary
   7.5. Operational Qualification (OQ)
   7.6. OQ Protocol Testing Summary
   7.7. Traceability Matrix
   7.8. Protocol Deviation Report
   7.9. Protocol Deviation Log
8. PROTOCOL DEVIATIONS
   8.1. Handling Protocol Deviations

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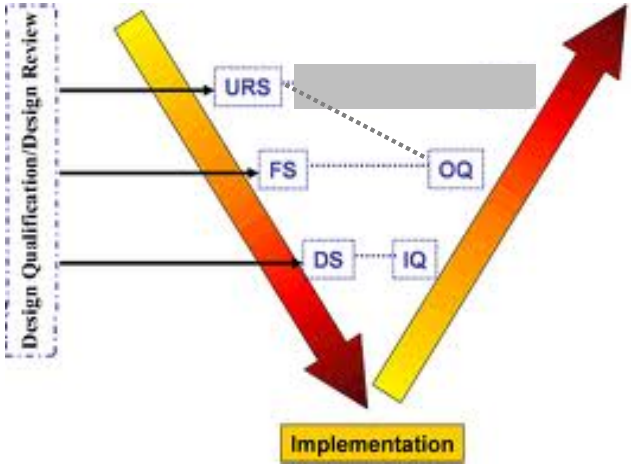
Related Validation Documentation

- **Installation Qualification Protocol (IQ)**
  - **Provides documented verification all critical aspects of System and its components (hardware, software, configuration settings, etc.) have been properly installed in accordance with System specifications.**

- **Operational Qualification Protocol (OQ)**
  - **Provides documented verification all critical aspects of the System and its components (hardware, software, etc.) operate in accordance with the functional requirements.**
  - **OQ tests for compliance with 21 CFR Part 11 requirements for -**
    - **Data integrity,**
    - **Security,**
    - **Audit trail,**
    - **Authentication.**



- **Ongoing Support Plan**
  - **Defines steps necessary to support the System to maintain compliance with 'Part 11'.**

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Related Validation Documentation

- **System SOPs**
  - **Assure System is maintained in a validated state during its operational use until retirement or revalidation.**
  - **Highly recommended SOPs include:**
    - **Document Management**
    - **Change Control**
    - **Configuration Management**
    - **System Security (logical and physical)**
    - **System Backup and Restore**
    - **Incident Management**
    - **Records Retention.**

- **Training Plan and Training Records for**
  - **Operators / Users**
  - **Technical Support Resources**

- **Validation Summary Report (VSR)**
  - **Describes results of validation, including variances to the Computer System Validation Plan**

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Title 21 CFR Part 11 - SUMMARY

- **ER's & ES's -**
  - **FDA is looking for demonstrated TRUSTWORTHINESS and RELIABILITY.**
  - **Compliance with Part 11 encompasses the ENTIRE System & All Documentation**
  - **Mostly applied to CLOSED SYSTEMS.**

- **ER's -**
  - **Accurate**
  - **Secure**
  - **Restricted Access**
  - **Thorough Audit Trails.**

- **ES's -**
  - **Unique**
  - **Carry the same authenticity and integrity as a handwritten signature**
  - **Follow Strict Policies for User Names and Passwords**

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Title 21 CFR Part 11 - SUMMARY

- **Implementation -**
  - **Have comprehensive SOP's and Policies.**
  - **Use many of the features that already exist in Microsoft's products for security and audit trails**
  - **Work closely with the IT and 'Compliance' groups**
  - **Validate the System.**

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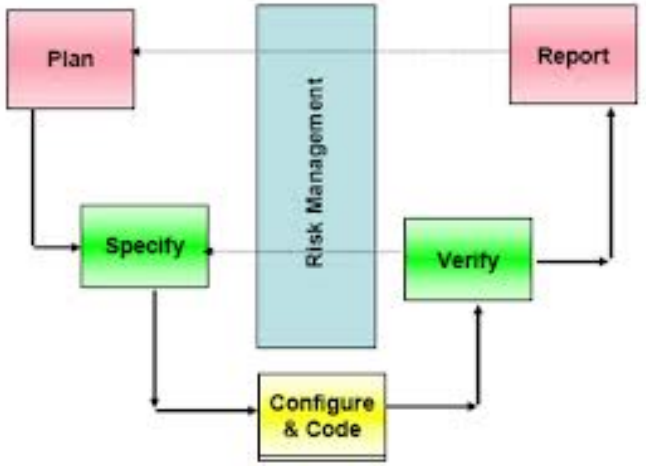
21 CFR Part 11

- **Validation Docs -**
  - **Requirements must be measurable and traceable**
  - **Create requirement docs with testing and verification in mind**
  - **Use GAMP 5 as a guide → http://www.ispe.org/gamp-5**



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Questions?

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