
Application of Digitization in Regulated Inspection Activities

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Applying digital engineering innovations in the inspection and verification of quality assurance activities for the manufacture and construction of Structures, Systems, and Components

- Digital Records
- Digital Imaging
- Digital Non-Destructive Examination (NDE)
- Digital Data Acquisition

Digital Records - Examples

- ✓ Work packages, test reports, M&TE calibration data
- ✓ ASME design and data reports
- ✓ Non-destructive examinations
- ✓ Design specifications, drawings, and calculations
- ✓ Reconciliation deviations/nonconformances
- ✓ Virtual as-built structures, systems, components (SSCs)
- ✓ Corrective action program data

ASME COMPONENTS

- ASME Design Reports
- ASME Data Reports
- CMTRS
- Welding
- NDE
 - liquid penetrant
 - ultrasonic
 - radiography
- Deviations/nonconformance
- Qualifications
- Digital documentation
 - ASME reports
 - work packages
 - deviations/nonconformance reconciliation
 - qualification records
 - M&TE calibration records
- Digital NDE
 - digital imaging
 - remote inspection
 - artificial intelligence
- Advanced technology / automation
- Digital Twins 3D modeling
- Virtual inspection

Reinforced Concrete Structures

- Structural calculations
- Structural drawings
- Reinforcing steel
 - size, length, splices, spacing
- Engineering & Design Change Requests (E&DCRs)
- Nonconformance reports (NCRs)
- Structural reconciliation report
- Cylinder breaks & batch tickets
- Structural steel
- Digital documents
 - work packages, E&DCRs, and NCRs
 - structural calculations & drawings
 - structural reconciliation report
 - cylinder breaks, batch tickets
- Digital data - reinforcing steel placement
 - drone technology
 - artificial intelligence
 - digital twin 3D modeling
- Concrete placement
 - consolidation
- Surveys
 - wall, floor, ceiling thickness
 - critical dimensions

Challenges

- Data Security
- Standards
- Accuracy
- Reliability
- Repeatability
- Clarity and level of detail
- Cost/benefit