Compliance to Global Regulatory Demands in Pharmaceutical Industry through Automation

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Nicholas Piramal India Ltd (NPIL)
Agenda

• About NPIL

• Global Trends In Pharma Industry

• Major Regulatory Requirements

• How Automation Can Help

• User Perspective
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Nicholas Piramal India Ltd

- Leading pharmaceutical healthcare company with turnover of around Rs.2000 Crores

- Strong presence in cardiovascular, antibiotics, respiratory, pain management, anti diabetics and bulk drug segments of Indian pharma market

- Global conglomerate with over 7,500 employees from 45 different nationalities

- Part of Piramal Enterprises, a diversified Indian business house having interests in retailing, textiles, auto components and healthcare
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Global Trends in Pharma

- Sales up, R&D up, CAPEX tight
- Fewer Blockbuster drugs in the pipeline
  - More novel drug activity
  - Biological therapies “tuned” to your body chemistry
- Transition from supply driven market to a demand and service driven market
  - Manufacturing efficiency and responsiveness plays Critical Role
  - Maximizing Asset Utilization and ROA, Key for survival
- From Indian perspective:
  - Immense Global Contract Manufacturing opportunities
  - Stringent Regulatory Compliance a must for regulated exports
Key Pharmaceutical Industry Challenges...

- Improve Time-to-Market
- Manufacture Cost-Effective Product for Delivery Worldwide
- Meet Global Regulatory Requirements
- Minimize Manufacturing and Automation Risks
- Improve Return on Assets
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Major Regulatory Requirements

cGMP guidelines from various regulatory bodies such as US FDA, MHRA, TGA, MCC:

- cGMP’s for the 21st century
- Product quality and performance ensured through the design of effective and efficient manufacturing processes
- Continuous real time quality assurance
- Regulatory policies and procedures are tailored to the most current level of scientific knowledge
- Risk-based regulatory approach
  - The level of scientific understanding affects product quality and performance
  - The capability of process control strategies to prevent or mitigate the risk of producing a poor quality product
Pharmaceutical Manufacturing Comprises Islands of Activities

- Production Order Management
- Work Order Management
- Production Scheduling
- KPI analysis
- Material Management
- Dispensing Management
- Equipment Management
- Charge Liquids
- Heat
- Charge Solids
- Reaction
- Distillation
- Phase Separation
- Discharge
- Executing Dispensing
- Moving Containers
- Executing Manual Ops.
- Review
- Investigate
- Approve
- CAPA programs
- Prepare Sample Program
- Execute Sampling
- Analyze Samples
- Release Results
- Manage Analytical Methods
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How Automation Can Help?

- Bridge The Gap Between Various Island Activities for integrated seamless communication from the sensor to the enterprise

- Leverages common modules / standards for consistent and repeatable manufacturing operations

- Integrated electronic batch reporting compliant with latest regulatory requirements

- Reductions in material use, batch to batch variability, manual operator errors

- In addition offers Operational Benefits which include reduced overall project execution calendar time, reduced switch over time
Standards-Based Solutions

Level 4: Business Planning and Logistics Systems
Level 3: Manufacturing Operations and Control Systems
Level 2: Data Collection, Operator and Batch Control Systems
Level 1: Equipment Control Systems
Level 0: I/O and Sensors

Business Process Information Network
Operations Information Network
Automation Network
Discrete Device
Process Device
Discrete Manufacturing
Continuous / Batch Manufacturing

Source: ANSIISA
Continuous Real Time Events and Historians

- Trends seamlessly combine Real-time and Historical data
- All system events are stored to within 1ms
**Version Control Audit Trail**

- Integrated change management system
- Comprehensive change history
  - who, when, what, check-in comment
  - Optionally include operator graphic files and recipe authorization
- Graphical & textual version to version comparisons
- Version rollback capability
- Supports FDA (21 CFR Part 11), OSHA, and ISO9000 compliance
VCAT: Graphical Differences Analysis Display

New Comment

Deleted Step

Modified Step
VCAT: Textual Differences Analysis Display

Deleted Step

New Formula
Bridging the Islands of Automation

Compliance Suite

- Control System
- Documentation Compliance
- Training Information System
- Weigh & Dispense
- Material Tracking
- LIMS
- Equipment Maintenance
- Atypical & Abnormality Tracking
Automation Impact Areas for Pharmaceutical ROI

Return on Automation (ROA)

- Reduced Drug Time to Market
- Improved Process Performance
  - Reduced Raw Material Usage
  - Reduced Batch Variability
  - Improved Production Yield
- Reduced Down Time Between Campaigns
- Improved Production Management Decision Support
- Improved Equipment / Manpower Utilization
- 21 CFR Part 11 Compliance

Operational Benefits

- Engineering Costs
- Purchasing Costs
- Installation Costs
- Commissioning Costs
- Validation Costs
- Training Costs
- Parts & Service Costs
- Maintenance Costs

Total Cost of Automation
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Automation From User Perspective

- Define Automation Goal/Objective:
  - Manufacturing Excellence
  - Regulatory Compliance Aid
  - Customer Preference

- Automation Partner (v/s vendor)
  - Understanding of Pharma requirements
  - Complete Suite of automation solution from Sensors to ERP integration

- Competency requirements
  - Complete understanding of regulatory requirements
  - Necessary skill sets to define, Implement, Operate and Maintain Automated System
Experience from NPIL

- Anesthetic Manufacturing EOU facility, H’Bad
- The first facility in Asia to manufacture inhalation anesthetic
- Facility Certified by MHRA, UK
- Challenges :
  - Highly hazardous and complex process consisting of combination of Batch and Continuous operations.
  - Tight project implementation, stabilization & facility validation/approval schedule to meet transition plan
  - Lower Operational cost compared to parent facility
Experience from NPIL

→ How Automation Helped:

- Project time cycle reduced from 18 months to 13 months
  - Fully integrated DCS system with Batch software suite and Smart Field Instruments
  - Use of standard templates in reducing DCS software implementation time
  - Operator Training on simulator completed before start-up
  - Drastic reduction in number of trial batches to stabilize quality critical parameters before Validation
  - Shorter Validation period based on DCS generated Electronic Batch Records

- Major contributor in obtaining Regulatory approval right in the first audit by MHRA, UK without any non conformance.