



Avarent LLC
1812 West Cortland
Suite 3F
Chicago, IL 60622
Tel (646) 269-3404

PROJECT CASE STUDY

Client: Large Multi-National Pharmaceutical and Biologics Manufacturer
Duration: Year
Scope: 21 CFR Part 11 Planning and Remediation, and ERP Validation

1.0 Introduction

The client was preparing for FDA approval of a facility to manufacture products for sale in the US. The production facility utilized software systems for business, manufacturing, and quality compliance that were not validated and needed to create a strategy for 21 CFR Part 11 compliance. The client had no experience with 21 CFR Part 11 or software remediation. Avarent was introduced to the project to assist the client with the development of software quality assurance, management responsibility, 21 CFR Part 11 planning and remediation, and validation oversight.

2.0 Process

- **Software Quality System**

The client had no software quality system in place to address aspects of 21 CFR Part 11 related to their business, manufacturing, and quality operations. A task force was created to establish a software quality system. The initial task was the development of management responsibility structure for the ownership of the software buying, validation and maintenance processes. This allowed for the development of many different software remediation plans with the responsible parties clearly identified, and facilitated tracking and resolution of issues.

- **21 CFR Part 11 Planning and Remediation**

A software inventory survey was performed by each department to identify all the software components. Each piece of software was given an associated risk in order to create a triage of software remediation. The software was broken in to four (4) distinct categories:

1. ERP/MRP – JDEdwards ERP and PlanExpert Maintenance/Calibration tracking software
2. Manufacturing Control – PLC, SCADA, Computer Archiving Systems, etc.
3. Lab/LIMS – Equipment control software, etc.
4. Statistical – Excel spreadsheets with macros, statistical analysis software, etc.

After the identification and prioritization of all the software systems, each respective software manufacturer was contacted in regards to 21 CFR Part 11 compliant versions or patches. When 21 CFR Part 11 remediation was not offered, three (3) alternative vendors were identified for each product based on specifications. The specifications were determined by the end user with Plant Engineering controlling the process.

- **Remediation Plan**

A 21 CFR Part 11 Remediation Plan was created to be implemented over a two (2) year period culminating in 2003. Each department was responsible for budgeting and ensuring that all their software systems were compliant. Each piece of software was prioritized by ranking associated risks for product safety and regulatory visibility. Budgets were created as well as specific timelines for remediation considering operations. The plan was flexible to allow the client to work on multiple systems at once, and giving a clear, defined hierarchy of systems to focus on in the event of a problem in the remediation path.

- **Results**

The number of software systems requiring 21 CFR Part 11 remediation was decreased to increase efficiency and decrease maintenance costs. The Manufacturing Control software was converted to a single software source, Siemens. This provided a common interface for all operators of plant software as well as a simplified validation approach. The Excel spreadsheets with macros were converted to SAS modules to eliminate the need to keep version control for over 50 separate spreadsheets.

The PlanExpert software was replaced by a manual paper system. After interviewing the end users, the team realized that the department manager was not aware that the software did not meet the needs of the maintenance staff. After reviewing the options available and the associated costs, the team decided that converting to a paper system was the best solution until a complete re-implementation of JDEdwards occurs. The paper system was created with input from the end users without interruption of service.

The JDEdwards system required custom modification and validation. Fundamental GMP flaws were identified within JDEdwards. Most were fixed by process changes, but few required modification of the underlying C code. Two outside firms were contracted to produce these modification under GMP design control. The baseline (vanilla) JDEdwards system was validated prior to the introduction of the fixes. The fixes were introduced into the system and regression tested. JDEdwards Version 8 will be installed in 2003 to bring the software to full 21 CFR Part 11 compliance.