

USPS-LR-L-194

Automatic Induction Systems for the
AFSM 100 (AFSM-ai) Decision Analysis
Report

Introduction

Library Reference USPS-LR-L-194 is a Category 3 library reference relied upon by witness Miller (USPS-RT-8). This library reference contains the Decision Analysis Report (DAR) information¹ that describes the following flats technology enhancement: the Automatic Induction (AI) system. For this report, the title page, Section 1.0 (Introduction), Section 2.0 (Background), Section 3.0 (System Description), and Section 4.0 (System Benefits) has been provided.

¹ Restricted information has been redacted.

USPS-LR-194

Page 1



DECISION ANALYSIS REPORT

**210 Automatic Induction Systems for
the AFSM 100 (AFSM-ai)**

ENGINEERING

RESTRICTED INFORMATION

June 17, 2004

1.0 INTRODUCTION

This Decision Analysis Report (DAR) recommends the approval of [redacted] million in funding for the purchase of 210 Automatic Induction Systems for the Automated Flat Sorting Machine 100s (AFSM-ai). A capital investment of [redacted] million, an expense investment of [redacted] million, and [redacted] million in undiscounted lease costs are expected to provide a [redacted] percent return on investment. The total amount for determining approval authority is [redacted] million, which includes the discounted lease costs of [redacted] million plus the [redacted] million in undiscounted capital and expense investment funding. AFSM-ai is an important component of a fully automated processing center and supports the corporate strategy for automating flat mail processing operations.

This purchase of the first 210 AFSM-ai systems includes 206 operational systems, deployed to 100 plants, plus four training systems. One of the operational units will be deployed earlier as a pre-production unit. The completion of the AFSM-ai program will allow the Postal Service to reduce flat mail automation costs by decreasing the staffing requirements of the flat mail processing operations.

2.0 BACKGROUND

Significant investments have been made in the automation of flat mail processing. The largest portion of these investments provided 534 Automated Flat Sorting Machine 100s (AFSM 100), currently located in 236 processing plants throughout the country. The AFSM 100s, which are our primary tool for sorting flat mail, are constantly being examined to determine ways to increase the effectiveness of these machines. Continuing improvements have enhanced the feeding and recognition functions of these machines. In addition, the Flats ID Code Sort (FICS) and Automatic Tray Handling System (ATHS) enhancements were approved and will be deployed during the next few years.

In the current method of flat mail preparation, containers (hampers, cardboard pallet boxes, U-carts or wire containers) of bundles of flats are received from the Small Parcel and Bundle Sorter or similar break down operation. The bundles are opened one at a time by removing any accompanying plastic wrap, rubber bands, plastic straps or string. The bundle is then faced and stacked onto a Flat Mail Cart (FMC), which in turn is transported and staged for processing on the AFSM 100s. This work is currently performed by mail handlers working in Operation 035, Flat Mail Preparation, which varies in staffing and efficiency from plant to plant.

The existing AFSM 100 operation requires five employees. Three employees operate the three feed stations while the other two employees sweep the machine, removing full flat mail trays to a transport belt and replacing them with empty, labeled trays. The Automatic Tray Handling System (ATHS) program, approved by the Board of Governors in August 2003 will reduce the sweeper requirements of 350 AFSM 100s from two employees to one.

3.0 SYSTEM DESCRIPTION

The Automatic Induction system consists of three main components; the flat prep system, the ACT transport system, and the automatic feeders. These components are illustrated in Figure 1 and discussed in detail as follows:

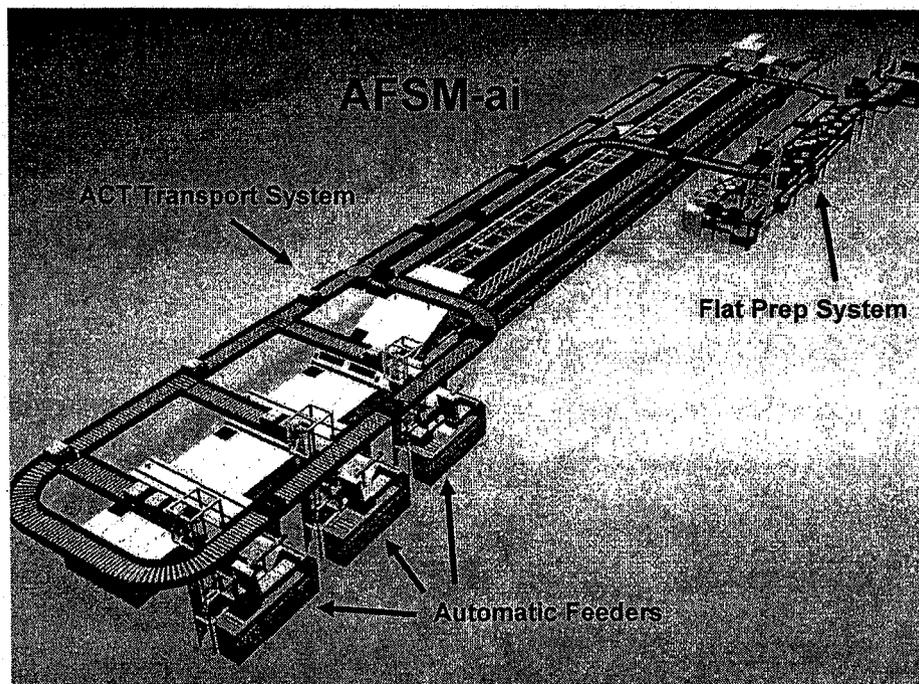


Figure 1 – AFSM-ai System Components

Flat Prep System

AFSM-ai improves the Flat Mail Preparation operation, by relocating the prep operation adjacent to the AFSM 100, and by replacing the arrangement of Flat Mail Carts (FMCs) and other containers with a state of the art preparation and transport system. The prep system consists of a container unloader, at which bundles of mail are placed onto a transport belt, which in turn distributes the bundles of flats among several ergonomically designed workstations. The transport belt can also be used to distribute flat mail trays to the prep workstations. (see Figure 2)

Each workstation is staffed by one Mail Handler. This employee opens each bundle of flat mail and stacks the flats into an empty Automation Compatible Tray (ACT). Debris such as plastic wrap, strapping, string, and rubber bands is taken away by an integrated pneumatic tube collection system. When the ACT is fully loaded, the employee releases it for transport to the feed end of the AFSM 100 and the system places another empty ACT onto the workstation shelf.

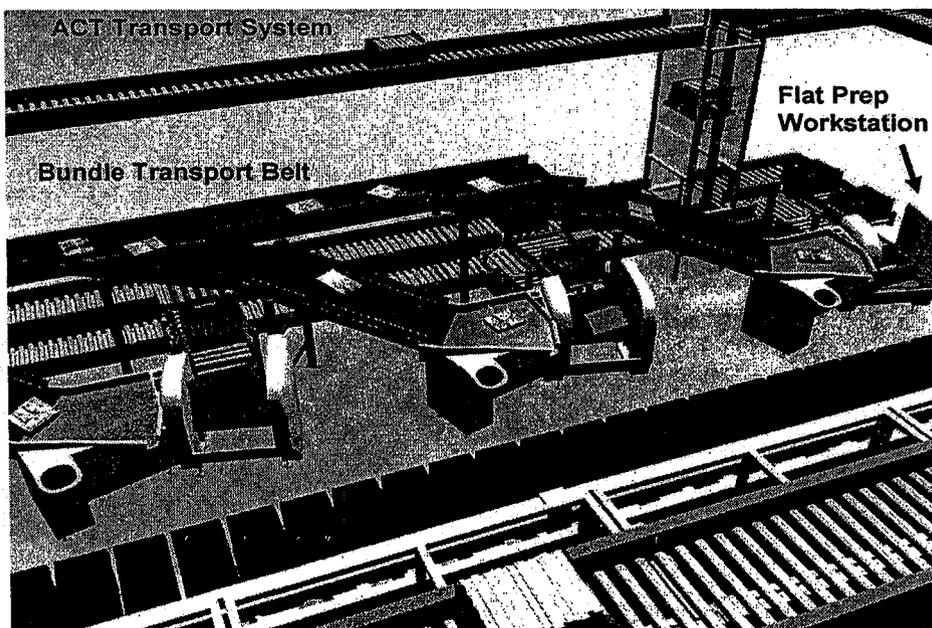


Figure 2 – AFSM-ai Flat Prep System

ACT Transport System

The accompanying tray conveyor system provides a controlled flow of full ACTs from the prep workstations to the AFSM 100 feed stations. It also transports empty ACTS from the feed stations back to the prep workstations for reuse by the employee. This system consists of powered roller conveyors, vertical lifts, turntables and controls, which transport, stage and deliver the trays to vertical lift towers installed at each feed station.

Automatic Feeders

As each feed station processes its current supply of flats, a new ACT full of flats travels down the vertical tower and slides along the feed table into position behind the existing stack of flats. The automatic feeder then removes the front panel of the ACT, slides it forward against the stack, and slips the ACT out from under the mail while maintaining forward pressure on the new, larger stack of flats. The flats are automatically fed into the feed module of the AFSM without any required assistance from an operator. (see Figure 3)

After the ACT is emptied by the automatic feeder, it travels back up the vertical tower, through the conveyor system, and back to the prep stations for reuse. The tray conveyor system simultaneously manages the flow of full and empty ACTs to ensure smooth operation of the flat mail preparation and sorting functions. It also enables the crew to prepare flats for the next sort plan, even if the processing of the current sort plan is not yet finished.

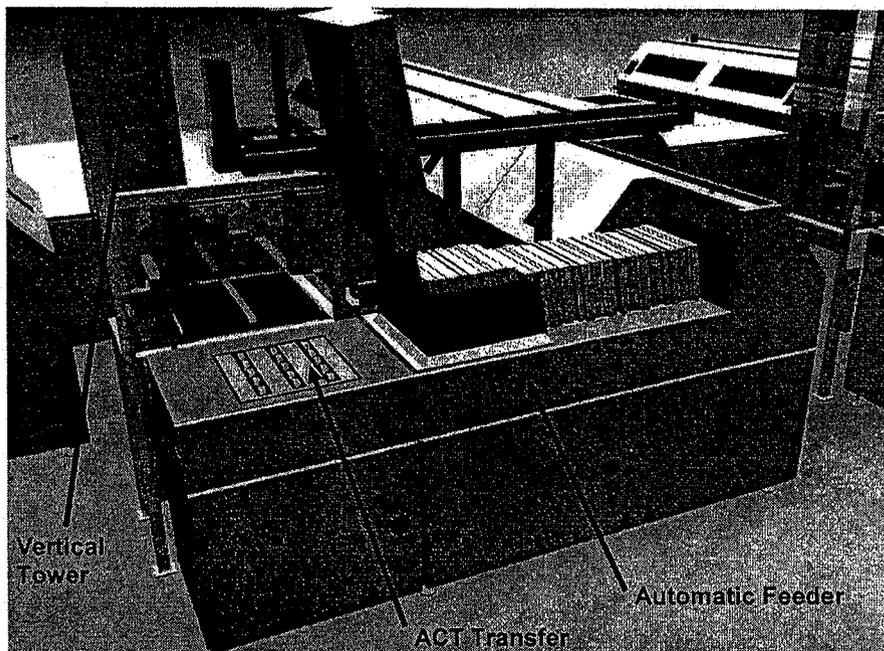


Figure 3 – AFSM-ai Automatic Feeder

As an additional part of the AFSM-ai program, the feed modules on the program AFSM 100s will be retrofitted with the T-10 modification. This modification, consisting of both hardware and software additions, increases the speed of the feed and transport modules and is expected to boost the throughput of the AFSM 100 by as much as 15 percent.

4.0 JUSTIFICATION / SYSTEM BENEFITS

The AFSM-ai program reduces clerk work hours, and impacts mail handler work hours in the Flat Preparation (Operation 035) and AFSM 100 operations as follows:

T-10 Modification

The T-10 modification is a combined hardware and software modification that increases the throughput of the AFSM 100 and reduces the number of operating hours needed to process the available volume. Therefore a portion of the savings is captured by processing mail faster and with fewer work hours.

Automatic Feeders

The automatic feed capability enables the reduction of feeders on the AFSM from three clerk employees to one clerk employee for each hour of machine operation.

Processing of Flats in Trays

During the processing of mail arriving at the AFSM 100 in flat trays, two mail handlers will be required to remove the flats from the trays and to stack them into ACTs. This requires a similar effort to feeding the flats manually at the feed stations. Therefore, there will be no net reduction of work hours during the processing of flat mail in trays, but there will be some dollar savings as clerk work hours are replaced with lower cost mail handler work hours.

Processing of Bundled Flats

During the processing of flats arriving at the AFSM 100 in bundles, mail handlers are utilized to unload the containers, to place the bundles onto the transport belt and to open the bundles and place the flats into the ACTs.

During the testing at the Southern Maryland P&DC the sortation of bundled flats consist of two different processing schemes, Sectional Center Facility (SCF) / Incoming Primary (INP) and Incoming Secondary (INS). In Incoming Primary processing, flats are sorted by 5 digit ZIP codes for further distribution downstream. The processing runs are lengthy and continuous and in order to keep the AFSM 100 supplied with mail all prep stations must be fully staffed.

Incoming Secondary processing runs are not as lengthy and continuous as SCF runs. Since the prepping of flats can continue during the frequent sort plan changeovers, the AFSM-ai prepping operation can be maintained without additional resources during Incoming Secondary processing.

Currently, there are no standard requirements for Flat Prep Operations; instead staffing is based on the local site's available space and other operating constraints. The work hours required to prepare flat mail in operation 035, as well as on the new AFSM-ai prep system, were computed using historical volume and productivity data, and were based on the site's average AFSM 100 daily volume, the national average of non-carrier routed presorted flats, and standards set for the prepping of flat mail into Flat Mail Carts. Although there will be some savings from the improved prep methods, the shifting of labor from clerks to mail handlers during the processing of mail in flats trays results in a small net increase in mail handler work hours for this program.