

Federal Aviation Administration

A White Paper on the
National Aeronautical Charting Office
(NACO)
High Performing Organization (HPO)



June 30, 2008

Federal Aviation Administration

< This page intentionally left blank >

EXECUTIVE SUMMARY

The National Aeronautical Charting Office (NACO) is an organization within the Federal Aviation Administration (FAA) whose mission is to promote safe and efficient air travel by producing and disseminating aeronautical navigation charts and data to both public and private customers. In the spring of 2007, the FAA's leadership elected to pursue a High Performing Organization (HPO) designation for NACO as part of the FAA's Commercial Services Management program¹ and an alternative to a public-private competition. The main objectives of the HPO effort were to identify and realize savings from a more efficient organization, to increase performance and quality, to re-focus the organization on its core mission of disseminating aeronautical information, to re-align NACO with the FAA's broader goals, and to prepare NACO to meet its long-term challenges.

In the fall of 2007, an HPO Team composed of members from the FAA's Office of Enterprise Solutions (OES), NACO, and NACO's parent organization, Aviation System Standards (AVN), began a comprehensive assessment of the organization, building on previous studies. The assessment included an evaluation of NACO's business model, workload analysis, and a benchmarking study of other, similar printing operations to identify best practices. In addition, AVN established new Integrated Information Technology (IT) and Data Services Teams to focus on business process re-engineering (BPR) and integration opportunities as part of the HPO.

Since its transition from the National Oceanic and Atmospheric Administration (NOAA) to the FAA in 2001, NACO had initiated several improvements to its business processes. However, the HPO Team identified a number of key challenges still facing NACO as well as additional opportunities for improving the organization's efficiency and effectiveness. Despite technological advancements in cartography and printing, NACO continued to utilize costly and labor-intensive manual processes in its Aeronautical Charting and Reproduction Teams. NACO's chart agent distribution network numbered over 2,500 agents, many of which were not compliant with the sales provisions of their contractual agreements. In addition, although NACO's authorizing legislation allowed it to charge customers for its products and recover a significant portion of costs, NACO lacked a structured pricing methodology. NACO also lacked a strategy for responding to an expected long-term shift in demand from paper to digital products. Finally, the integration of database systems presented a significant opportunity to eliminate redundant work processes and ensure the consistency of source data by combining parallel activities within AVN.

The HPO Core Team concluded its organizational assessment and adopted the following key recommendations for implementation of the NACO HPO:

- Integrate AVN database systems to significantly improve operational efficiencies and ensure the use of consistent and quality data across AVN;
- Establish International Organization for Standardization (ISO) quality objectives and metrics in the AVN Quality Management System to measure improvements in the quality of products and services;
- Shift operational control for IT and Applications to the AVN Integrated IT and Data Services Team. The deployment of new systems and applications is critical to the success of the HPO.

¹ In May 2008, the Competitive Sourcing initiative was superseded by a broader program known as Commercial Services Management.

Close collaboration and coordination is essential for the development of these highly specialized IT Applications. AVN's IT Application support currently resides in Acquisition and Business Services;

- Combine NACO with the National Flight Procedures Office (NFPO) and integrate data compilation activities and database systems to eliminate redundant processes and improve the quality of aeronautical navigation data;
- Replace manual, paper-based cartography with computer-to-plate (CTP) technology and digital mapping to eliminate contracting costs, increase efficiency, and enhance the quality and precision of NACO's aeronautical products;
- Reform the chart agent distribution model to reduce costs, increase efficiency, and promote e-commerce;
- Institute a new pricing methodology for paper products that links prices to costs to produce charts, increasing and maximizing revenue collected as provided for in the authorizing legislation;
- Establish a new discount structure for federal customers to increase NACO cost recovery, to increase customer accountability and to reduce waste;
- Consolidate facility space in Glenn Dale, Maryland and turn over unused space to the General Services Administration (GSA);
- Manage continuous improvement of the organization throughout and beyond the HPO time frame.

The HPO Team projects savings to gradually increase along with implementation progress from around \$2.8M during the first year (FY09) to an annual savings of approximately \$15.2M by FY13 and beyond. This savings represents a **28% reduction** from the COMPARE baseline cost estimate of \$55.1M. In addition, the new pricing structure is expected to increase revenues by approximately \$8.9M. The total yearly financial benefit (cost savings plus increased revenue) from implementation of all HPO initiatives is expected to reach close to \$24M by FY13. To ensure that the projected cost savings are realized by FY13, the initiatives must be implemented prior to the end of FY12. Furthermore, an estimated implementation cost of \$17.3M must be funded by FY11 in order to realize the projected benefits by FY13. The Core Team recommends the use of NACO's retained receipts to fund the implementation cost.

As part of the integration of NACO and NFPO, the organization will assume new and increased work requirements during the HPO period. These new requirements will require an additional 47 FTEs at a cost of around \$5.7M annually. Due to NACO becoming an HPO, it is expected that the additional 84,020 annual labor hours will be met by shifting resources through the efficiency gains rather than increasing resources.

In June 2008, the HPO Team began working with NACO and FAA leadership to develop an implementation plan for the HPO. To minimize the disruption to NACO's business processes, and considering the size of this implementation, full implementation of the NACO HPO is not expected to be completed until FY13. Careful management of the transition will enable NACO to reduce staffing levels through attrition.

In summary, the NACO HPO is projected to save the Federal Government a total of approximately \$45.5M during the five-year HPO performance period (not including the increased revenues increasing NACO's receipts by an estimated \$44M over five years), and an estimated \$15.2M per year thereafter. The new organization will be better positioned to serve the

needs of the FAA and meet future challenges. *As an HPO, NACO will remain focused on safety, while delivering higher quality aeronautical navigation products and service to its customers in the aviation community.*

< This page intentionally left blank >

SECTION 1: RATIONALE FOR BUSINESS PROCESS REENGINEERING (BPR)/ PURSUIT OF A HIGH PERFORMING ORGANIZATION (HPO)..... 8

1.1 Background..... 8

1.2 Rationale and Benefits..... 8

SECTION 2: DESCRIPTION OF CURRENT ORGANIZATION..... 10

2.1 Overview of NACO Operations 10

2.2 Current Products and Services Offered and Customers Served 10

2.3 Current Funding and Expenditures..... 13

2.4 FY07 Organizational Chart and Staffing..... 17

2.5 Identified Challenges 18

SECTION 3: DESCRIPTION OF ENVISIONED ORGANIZATION 22

3.1 Work Processes and Performance Improvements 22

3.2 Organizational Chart and Staffing 42

3.3 Business Model and Strategy 43

SECTION 4: EXPECTED SAVINGS, PERFORMANCE TRACKING AND CONTROL, IMPLEMENTATION, AND CONTINUOUS IMPROVEMENT 50

4.1 Expected Savings/Financial Impact and Costs 50

4.2 Performance Tracking and Control 51

4.3 HPO Implementation..... 52

4.4 Continuous Improvement Management Plan 53

SECTION 5: MILESTONES 56

< This page intentionally left blank >

SECTION 1: RATIONALE FOR BUSINESS PROCESS REENGINEERING (BPR)/ PURSUIT OF A HIGH PERFORMING ORGANIZATION (HPO)

1.1 Background

In December 2005, the Federal Aviation Administration (FAA) Administrator directed the Office of Enterprise Solutions (OES), which is part of the Air Traffic Organization's Finance Service Unit, to analyze the functions performed by the National Aeronautical Charting Office (NACO). The analysis included an examination of the functions and services performed by NACO, the costs associated with these functions and services, and the revenue generated through the sale of NACO products to the public.

The assessment of NACO uncovered potential areas for improvement and in August 2006, OES presented a series of near-, mid- and long-term recommendations to the Administrator. Under the Administrator's direction, OES began implementing the near and mid-term recommendations in September 2006. Due to the success of the implementation efforts and the potential for substantial and sustainable long-term cost savings, FAA leadership determined in the spring of 2007 that NACO was a suitable candidate for the High Performing Organization (HPO) designation. OES was charged with the development of an HPO business case. Since July 2007, OES has been extending the original assessment of NACO to include a more refined look at the NACO business model, an assessment of NACO processes and activities, and the calculation of NACO baseline costs.

In the fall of 2007, the FAA leadership appointed an HPO Core Team consisting of Aviation System Standards (AVN), NACO, and OES members to begin assessing the current state of NACO through cost analysis, workload analysis, examination of the existing business model, best practices benchmarking and analysis of current processes. The team planned to finalize the assessment of the current state and the design of a future, more cost effective organization by the end of FY08.

1.2 Rationale and Benefits

The rationale for NACO's pursuit of a High Performing Organization is the desire to realize tangible and sustainable benefits, such as cost and performance improvements, while meeting the goals of the President's Management Agenda (PMA). The rationale and benefits of achieving HPO status include:

- *Lack of Suitable Private Sector Competitors* – Market research determined there were too few responsible available competitors due to the highly specialized nature of the work.
- *Address Human Capital Issues and Secure Future for NACO* – The NACO HPO provides a framework for the proactive management of operational challenges including obsolete technology and retirement/attrition of staff.
- *Increased Efficiencies* – Efficiency improvements will allow NACO to better utilize limited resources, increase performance, and meet the needs of future workload increases.

Appendix – NACO HPO

- *Savings and Performance Improvements* – As an HPO, NACO can yield savings and performance improvements comparable to public-private competition, but with lower implementation costs and less disruption to the workforce.
- *Recognition of Accomplishments* – As FAA’s first HPO, NACO would be recognized for efficiency gains and model business practices.
- *Commercial Services Management² Credit* – Receiving the HPO designation will provide the Department of Transportation (DOT), the FAA and NACO with credit in meeting PMA objectives.

² In May 2008, the Competitive Sourcing initiative was superseded by a broader program known as Commercial Services Management.

SECTION 2: DESCRIPTION OF CURRENT ORGANIZATION

2.1 Overview of NACO Operations

In 2000, NACO was transferred from the National Oceanic and Atmospheric Administration (NOAA) to the FAA by the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century. NACO's function and mission is to compile, print, and distribute aeronautical navigation charts, data, and related publications.³ In addition, NACO supports the global aviation community by supplying other countries with aeronautical chart products and participating in national and international aeronautical committees. Involvement in these committees and with the International Civil Aviation Organization (ICAO) helps set the strategic direction and U.S. position for the standardization of international aeronautical charts and flight information products. In addition, NACO provides chart seminars and participates in community outreach programs to support aviation safety.

2.2 Current Products and Services Offered and Customers Served

2.2.1 Products and Services Offered

NACO offers an array of products and services to the aviation community, the U.S. Department of Defense (DoD), internal FAA customers, and to other government agencies.

2.2.1.1 Aeronautical Charts

NACO compiles, prints, and distributes paper and digital aeronautical charts. These charts are reproduced and distributed to the FAA, the military and to the commercial and general aviation communities through direct sales (by telephone, fax, and e-commerce), retail outlets (chart agents), and intergovernmental requests. NACO aeronautical charting products include:

- Visual Flight Rules (VFR) charts
- Airport/Facility Directory (A/FD) and other flight supplements
- Instrument Approach Procedures (IAP) charts
- Instrument Departure and Arrival charts
- Instrument Flight Rules (IFR) High and Low Altitude Enroute charts
- Controller charts
- Controller Radar Video Maps (RVMs) and Minimum Vectoring Altitude (MVA) data

Figure 2.1 illustrates the production process for aeronautical charting product.

³ Definition of compile: creation of new charts, processing and updating of information on charts including removal of obsolete information, and the collection and addition of data to the charts.

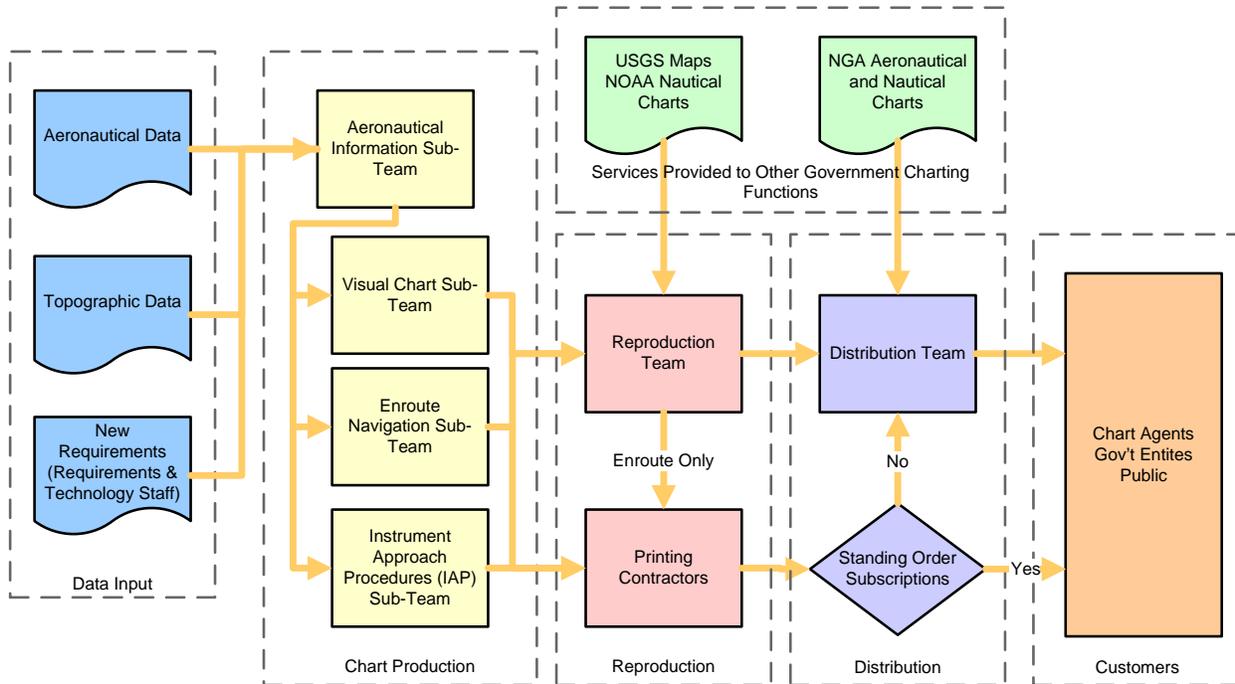


Figure 2.1: NACO Process Flow – Aeronautical and Nautical Charts

2.2.1.1.1 Visual Flight Rule (VFR) Charts

NACO is the only producer of original U.S. VFR charts, which are updated every six or twelve months (with the exception of Helicopter Route Charts, Special Charts and some isolated area Alaskan charts). VFR charts are updated using data from a variety of sources including the National Flight Data Digest (NFDD), the Weekly Obstruction List, U.S. Geological Survey (USGS) topography maps, road atlases, railroad maps, county/state highway maps, aerial photography, flight edit updates, airspace dockets, U.S. Coast Guard Marine Light lists and input from map users.

The compilation of aeronautical data for VFR charts is currently a manual process. Modifications are done by hand and verified by cartographers before VFR charts are sent to the Reproduction Team for printing. The handwritten changes to the VFR charts are then added to the printing negatives by negative engravers using computer cartography. Once all the changes are complete, the negatives are used to create printing plates. Once printing and other finishing processes are complete the VFR charts are transferred to the Distribution Team for storage and distribution to customers.

2.2.1.1.2 Instrument Flight Procedure (IFP) Charts

The Instrument Approach Procedures (IAP) Sub-Team produces IAP, Arrival, and Departure procedure charts. IFR charts are compiled using data from the National Flight Procedures Office (NFPO), National Flight Data Center (NFDC) and other FAA sources. Compilation of each IFP chart is a semi-automated process utilizing computer-aided design (CAD) as opposed to a fully automated database driven process.

After IFP charts are updated, the CAD files are converted to Portable Document Format (PDF) files and sent directly to the printing contractor (the Reproduction Team does not handle IFP

charts). The contractor fills subscription and chart agents' standing orders before sending the remaining inventory to the Distribution Team for storage and further distribution in response to future sales.

2.2.1.1.3 Enroute Charts

Approximately 75% of Enroute charts are purchased by the Department of Defense (DoD) with the public accounting for the remaining 25% of charts produced. These charts are updated digitally and changes are sent directly from the NACO Aeronautical Chart Team to the printing contractor. As of FY08, the Reproduction Team does not handle Enroute changes. The contractor fills standing orders and subscription sales before sending the remaining inventory to the Distribution Team.

2.2.1.2 Digital Data Products

NACO provides aeronautical information in digital form to NACO charting Sub-Teams, the aviation community and to FAA Air Traffic Control, NFDC and DoD. Digital products include:

- Radar Video Maps (RVMs) – These digital maps, including Minimum Vectoring Altitude Maps (MVA), are provided to 410 Air Traffic Control facilities. NACO maintains over 7,000 map files and must provide the information in five data formats due to lack of standardization at ATC facilities.
- Minimum Safe Altitude Warning System (MSAW) – This system is maintained in accordance with FAA orders and provides controllers with the information they need to warn pilots of terrain or obstruction hazards. NACO maintains 323 MSAW sites and provides updates to FAA and DoD through the Internet.
- Digital Obstacle File (DOF) – The DOF contains all reported man-made obstructions for 29 different structure types within the U.S. and in areas of the Caribbean, Mexico, Canada and the Pacific. Weekly DOF updates are sent to DoD and FAA offices while the 56-day DOF is available by subscription to government agencies and the aviation community.
- National Flight Database (NFD) – The NFD contains information to support Enroute and Terminal GPS navigation including: information on instrument procedures, airspace, airways, fixes, navigational aids (NAVAIDs) and airports. Information can be provided directly to a pilot or the Flight Management System of an aircraft. The FAA Enroute Automation Modernization (ERAM) Program is currently evaluating the NFD for use as source aeronautical data in future ERAM releases.
- Digital Terminal Procedures Publication (dTPP) – This DVD product contains all U.S. IFPs and airport diagrams that are contained in the printed TPP volumes. The dTPP product is updated every 28 days.
- NAVAID Digital Data File – This file provides a current listing of NAVAIDs in the U.S., Puerto Rico, and the Virgin Islands and select locations in Canada, Mexico, the Atlantic and Pacific. This file is updated every 56 days.
- Digital Aeronautical Chart Supplement (DACS) – This CD provides digital airspace data not otherwise available. The DACS is primarily an Air Traffic Control (ATC) data product, but is also provided to the general public. DACS is updated every 56 days.
- Digital Aeronautical Information compact disc (CD) (DAICD) – This CD contains the DACS, the DOF and the NAVAID Digital Data File.

Appendix – NACO HPO

- Sectional Raster Aeronautical Chart (SRAC) product – This three set DVD product contains Geo-referenced digital VFR charts for the U.S. including Alaska, Hawaii and Puerto Rico. The SRAC is updated every 28 days.

2.2.1.3 Other Products

NACO produces the Airport/Facility Directory (A/FD) which contains airport data including information on NAVAIDs, communications data, weather resources, special notices, and hours of operation, lighting codes, VFR waypoints and runway data. The directory also contains airport diagrams and sketches. NACO also produces a Pacific and Alaska Supplement Publication.

In addition, NACO produces the Aeronautical Chart Users Guide, which is a VFR/IFR teaching aid, a reference document, and an introduction to the wealth of information provided on FAA's aeronautical charts and publications. It includes explanations of chart terms and symbols, and a comprehensive display of aeronautical charting symbols organized by chart type.

2.2.1.4 Services Offered

In addition to producing its own products, NACO provides printing and distribution services to other government agencies. In FY07, NACO printed USGS maps⁴, printed and distributed NOAA nautical charts, and distributed DoD aeronautical and nautical charts.

2.2.2 Customers Served

NACO serves both the general public (via direct sales and chart agents) and the government. Table 2.1 shows a breakdown in the number of paper charts sold to each customer in FY 2007.

Table 2.1: Breakdown of Customers Served

Customer	Charts Purchased	Percent of Total Charts Purchased
Public – Direct Sales	1,251,796	11.5%
Public – Chart Agent Sales	3,031,669	27.9%
DoD	5,515,304	50.7%
FAA ⁵	753,246	6.9%
Other Government	324,640	3.0%
Total Charts Purchased	10,876,655	100%

2.3 Current Funding and Expenditures

2.3.1 Funding

2.3.1.1 Operations

NACO receives operations funding through its parent organization, AVN. When NACO was transferred to the FAA in 2000, AVN initially funded the Personnel Compensation & Benefits (PC&B) expenses for all of NACO's employees. In FY03, AVN and NACO agreed that NACO would fund PC&B expenses for 24 FTEs from its retained receipts account, thus reducing the amount of operations funding received from AVN. As shown in Figure 1, AVN funded 270 of NACO's 294 FTEs in FY07, which amounted to \$27.4M in operations funding. NACO applied \$0.95M from the retained receipts account to cover PC&B expenses for the remaining FTEs. The

⁴ As of FY08, NACO no longer prints USGS maps.

⁵ At present, FAA receives charts from NACO at no cost.

Air Traffic Organization (ATO) provided NACO with an additional \$2.3M in operations funding in exchange for the production of RVMs.

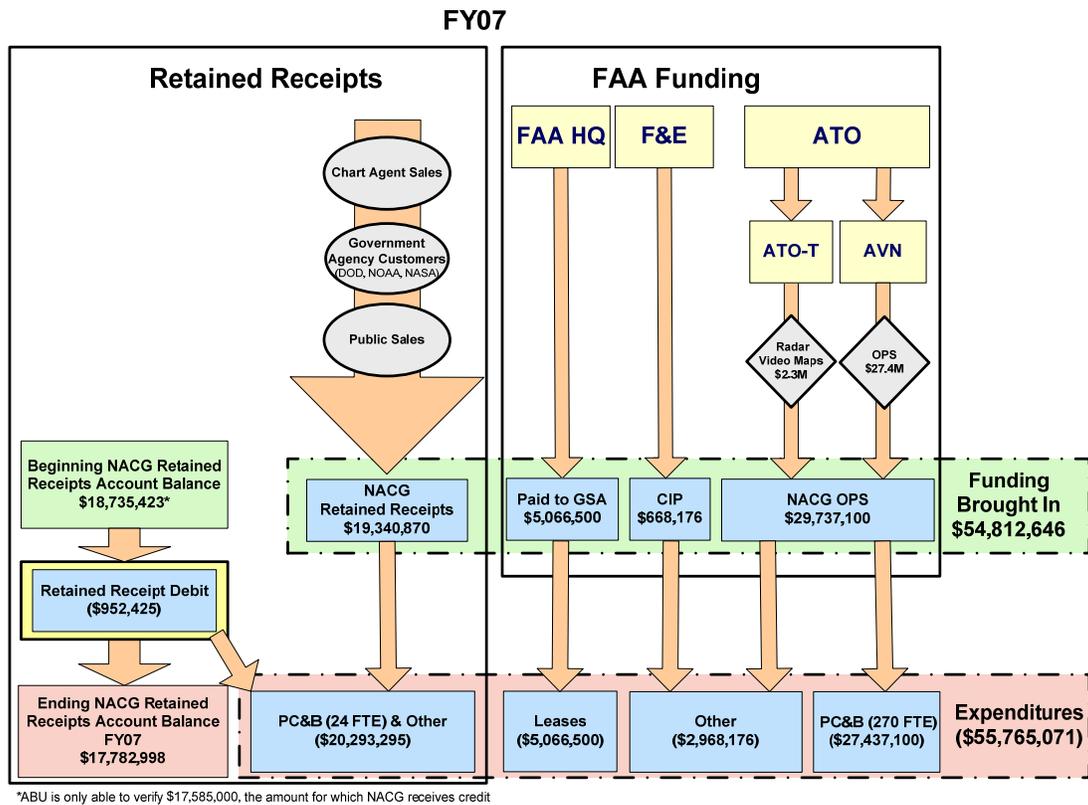


Figure 2.2: FY07 NACO Funding and Retained Receipts Flow

Since the allocation from AVN covers PC&B for only 270 FTEs, charges from the OPS account must be transferred to the retained receipts account to fund the remaining FTEs.

2.3.1.2 Retained Receipts

The retained receipts account contains the proceeds from the sale of NACO, DoD and NOAA maps to the public (via direct sales or through chart agents) and other Government agencies.⁶ Retained receipts are used to fund PC&B not covered by operations funding and all other expenditures including printing and distribution contracts and supplies. Starting in FY06, this account funded capital improvements. The balance of funds in the retained receipts account is carried over from year to year.

In FY07, NACO generated \$19.3M in revenue. Total obligations in FY07 exceeded total appropriated funds and revenue from the sale of aeronautical products. The difference between the amount received from sales and appropriated funds and the total amount of obligations was funded from the remaining balance of the retained receipts account. Figure 2.2 above illustrates the drawdown of the retained receipts balance in FY07. At the beginning of FY07 the balance of the retained receipts account was \$18.7M. During that year, \$952,425 was withdrawn to cover

⁶ Regarding DoD and NOAA charts, NACO is only authorized to recover the cost of producing and distributing DOD and NOAA charts; proceeds above and beyond those costs must be returned to Treasury.

Appendix – NACO HPO

the remaining obligations. The balance at the end of FY07 was \$17.8M. In the future, NACO will continue to use retained receipts to fund modernization efforts.

2.3.2 Expenditures

Table 2.2 shows NACO actual expenditures for FY07 (excluding expenditures for United States Postal Services (USPS) mailings). Building expenditures of \$5,066,500 are based on the cost of the Silver Spring and Glenn Dale facilities (but is shown separate from Rent, Communications and Utilities since it is paid directly to GSA by ATO).

Table 2.2: NACO Expenditures

NACO FY07 Expenditures		
	Percent of Total	Total
Total PC&B	52.35%	\$ 29,362,335
Total Non-Labor	47.65%	\$ 26,724,325
Travel	0.28%	\$ 155,872
Transportation	3.45%	\$ 1,934,787
Rent, Communications & Utilities	0.04%	\$ 19,761
Printing	17.99%	\$ 10,087,232
Other Services	12.15%	\$ 6,812,830
Supplies	3.44%	\$ 1,927,930
Equipment	0.69%	\$ 389,413
EEO Settlements	0.59%	\$ 330,000
Other Rent Expenditures*	9.03%	\$ 5,066,500
Total Expenditures	100.00%	\$56,086,660
*NACO facility expenditures are paid directly to GSA by ATO, but are nonetheless a NACO expense.		

Table 2.3 provides an overview of the services and supplies for which NACO has contracts.

Appendix – NACO HPO

Table 2.3: FY07 NACO Support Contracts

NACO FY07 Service Contracts		
Contractor Name	Amount	Description
GPO/Evolution Impressions	\$400,000	Coast Pilot Perfect Bound Printing & Distribution
GPO/Cenveo	\$43,000	Miscellaneous Publications Printing & Distribution
GPO/Bindagraphics	\$35,000	NOAA Nautical Recreation Chart Printing & Distribution
GPO/NPC, Inc.	\$4,100,000	U.S. & Alaska TPP Printing & Distribution
GPO/Fry Communication	\$900,000	A/FD, PCS, & SA Typesetting Printing & Distribution
William & Heintz Map	\$2,100,000	Enroute Charts Printing & Distribution
JAD Business Services, Inc.	\$60,000	Courier Service
K-Ton Mapping Corp.	\$170,000	Aeronautical Chart Drafting Support
APT Services	\$1,050,000	Administrative Support Services
Esher Grad Tech	\$94,000	Service contract for Escher Grad 9400 Imagesetters
NOAA – DOC	\$926,000	Building Services
TerraGo	\$10,580	SRAC: GeoTIFF to GeoPDF
NFD – Consulting	\$95,000	Bendixen
NFD – Coding	\$766,475	AeroNavData
ESRI	\$207,000	Consulting, Enroute Customization, AIB Tool
D2A Tool	\$2,500	DAFIF to ARINC Converter Tool Programming
Service Contracts Total		\$10,959,555
NACO FY07 Supply Contracts		
National Graphic Supply	\$263,976	Photo Imaging Supplies
Anocoil	\$87,000	Lithographic Printing Plates and Chemical Supplies
Finzer Roller, Inc.	\$16,000	Recover Printing Press Rollers
Sun Chemicals	\$90,000	Ink
G&K Services	\$20,500	Towels and uniforms
KC Color Management	\$27,003	Color Proofing System and Supplies
Supply Contracts Total		\$488,495
Total Contracts		\$11,448,050

2.4 FY07 Organizational Chart and Staffing

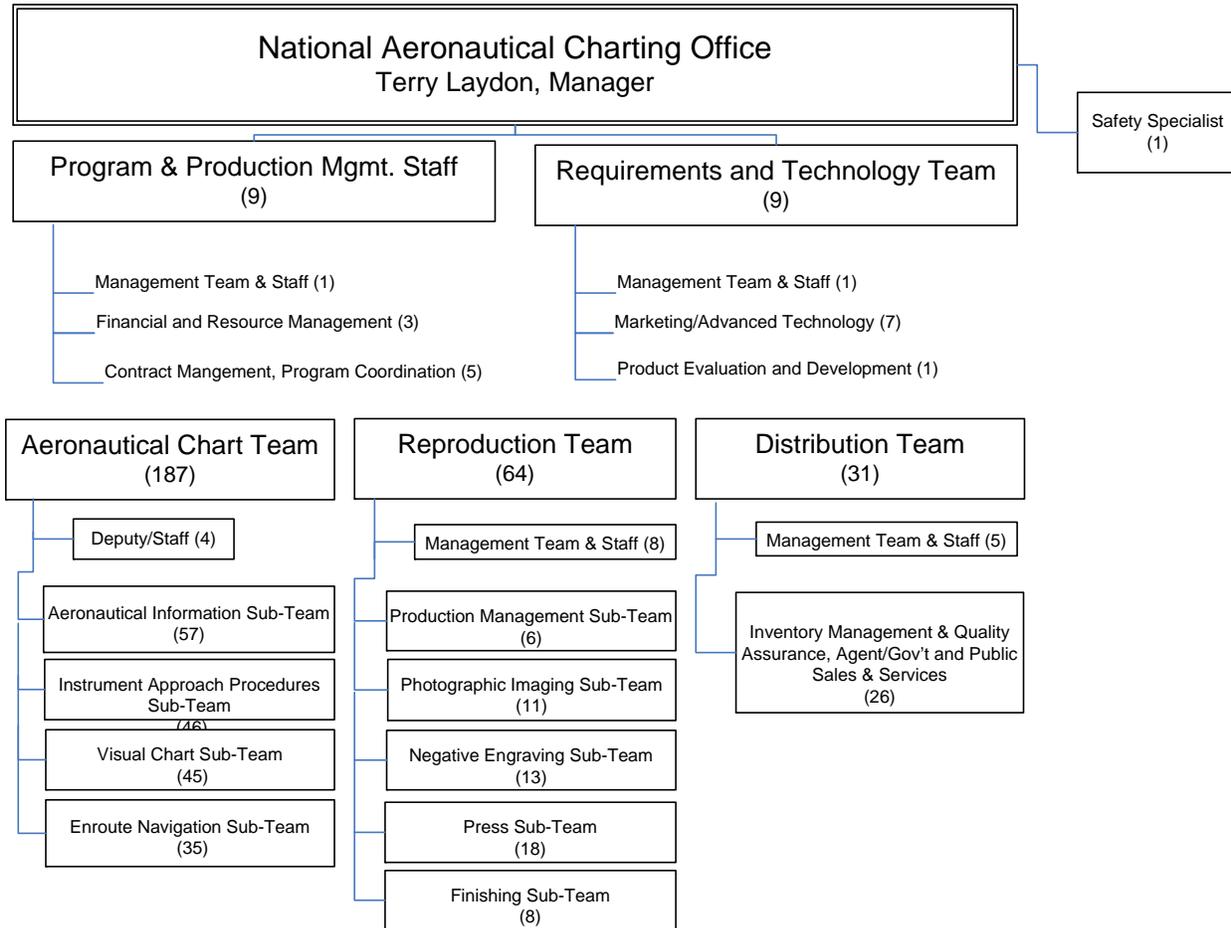


Figure 2.3: NACO Organizational Structure (Number of FTEs)

2.4.1 Program and Production Management Team

The Program and Production Management Team:

- Manages NACO Human Resource functions
- Provides financial management
- Determines procurement requirements
- Coordinates and processes personnel actions
- Manages property and facilities
- Monitors and reviews contracts
- Evaluates production capacities
- Coordinates special projects and requests
- Coordinates and monitors interagency agreements
- Determines basis for chart and product pricing

2.4.2 Requirements and Technology Team

The Requirements and Technology Team:

- Provides organizational technical guidance and long range planning
- Establishes and validates NACO charting requirements

- Coordinates product development and/or enhancements
- Performs product evaluation functions
- Represents NACO on government and industry aviation standards and advisory committees and working groups
- Manages Marketing Program
- Conducts pilot seminars on chart use and symbols
- Manages the NACO Internet site

2.4.3 Aeronautical Chart Team

The Aeronautical Chart Team:

- Supports the NACO mission directly by converting, validating and compiling aeronautical data received from a variety of sources
- Produces VFR and IFR charts and maintains aeronautical charting databases using validated data
- Provides cartographic support to FAA Air Traffic Service
- Produce a wide range of hardcopy and digital products to general aviation and military pilots and to FAA facilities including: VFR charts, IFR charts, the A/FD, controller charts, RVM and NFD

2.4.4 Reproduction Team

The Reproduction Team:

- Provides pre-press work including negative engraving and photo servicing
- Prints and finishes VFR, USGS and NOAA nautical charts (as of FY08, NACO no longer supports USGS products)

2.4.5 Distribution Team

The Distribution Team:

- Oversees warehouse and shipping contractors
- Maintains product sales accounting and payment collections
- Manages direct to public charts sales (one-time and subscription) and sales to chart agents, DoD and other government agencies
- Determines print quantity levels
- Approves and monitors authorized chart agents

2.5 Identified Challenges

2.5.1 NACO and AVN Integration

Since arriving at the FAA from NOAA in 2000, NACO's processes and systems have not been optimally integrated with those of its parent organization, AVN. To address these integration issues, Integrated Information Technology (IT) and Data Services Teams (Integrated Teams) were established to focus on opportunities that would increase NACO's integration with its parent organization AVN and improve data services throughout the AVN organization.

2.5.2 Product Pricing

2.5.2.1 Structure

During the original assessment of the NACO organization, OES found that NACO’s prices had not been adjusted since the organization was transferred from NOAA to the FAA in October 2000. At the time of the assessment, prices remained at the level set by NOAA authority prior to FY01. While a part of NOAA, NACO had adjusted prices regularly based on the products’ unit costs. Since its transfer to the FAA in 2000, however, NACO no longer had a system in place to calculate and analyze unit costs. In FY07, NACO increased the prices for all of its products by an average of 8% as a short-term measure to keep pace with rising costs.

Following the original assessment, the OES team worked closely with the FAA’s legal counsel to determine which costs could be recovered through product pricing under NACO’s authorizing legislation (Public Law 106-181). On the basis of the legal interpretation, OES collaborated with NACO and AVN staff to develop a methodology for collecting cost data and classifying costs as recoverable or non-recoverable for each product. The OES team then began the development of a pricing model that would yield updated product prices that maximize the recovery of allowable costs, in accordance with the legislation. Table 2.4 shows NACO’s total revenue and costs for FY07. NACO’s revenue fell short of the costs it was allowed to recover in FY07 by approximately \$14M (recoverable production costs minus total receipts).

**Table 2.4: Cost of Production vs. Receipts
FY 07 Costs and Receipts for All Products**

Total Receipts	Total Cost of Production	Recoverable Production Costs
\$22,265,215	\$45,515,297	\$36,602,563

2.5.2.2 Discount Rates

NACO offers a range of discounts by customer group, product, and type of order. Table 2.5 summarizes the discounts offered to major customer groups.

Table 2.5: NACO Product Discounts

NACO Discounts	
Customer	Discount
Individual on-time sales & subscriptions	0%
Chart agents	40%
Federal Aviation Administration	100% (free)
Department of Defense	Ranges from 17% to 90% (average of 86%)
Libraries, schools, & scientific institutions	10%
Members of Congress	100 free charts, full price after 100
Other government agencies	40%
National Archives, Depository Libraries, & Library of Congress	100% (free)

2.5.2.2.1 DoD Discounts

NACO offers multiple discount rates to DoD. Not only do DoD’s discounts vary by product, NACO also offers DoD a lower set of discounts for unscheduled orders than for scheduled (advance) orders to reflect higher costs. Consequently, DoD received discounts ranging from 16% to 90% in FY07, with an average weighted discount of slightly more than 86%. Just as for

the prices offered to NACO's other customers, the prices offered to DoD were not changed between October 2000 and the start of FY07.

2.5.2.2.2 Chart Agent Discounts

NACO sells its products at a 40% discount to approximately 2,500 aeronautical and nautical chart agents, who resell them to retail customers at no more than NACO's full prices. In the retail industry, offering a standard discount to product vendors is common practice. The NACO discount rate has varied over time but has not been changed in approximately 30 years.

2.5.3 Product Sales

In FY07, NACO received approximately \$19.34M in revenue from the sale of approximately 11 million NACO paper and digital products. The majority of NACO products were purchased by chart agents and DoD. These customer groups also received the largest discounts (with the exception of the FAA), which significantly reduced the proportion of costs recovered through product sales (these customers purchase a large proportion of NACO products, but generate a smaller proportion of total revenue).

2.5.3.1 Returns

NACO allows chart agents to return all unsold expired charts within 60 days of the expiration date for a full refund to their chart agent accounts. As part of the agreement that chart agents sign with NACO, agents must keep their return rate below 20% or face cancellation. Accounts are reviewed annually to identify vendors with return rates exceeding 20%. In December 2006, letters were sent to agents that were not compliant with the 20% ceiling on returns. Enforcement of this policy was subsequently reviewed, as some chart agents remained non-compliant. In FY07, NACO's chart agents returned a total of 848,541 items with a total sales value of \$2,584,664. Nearly 50% of chart agents had return rates above 20%, with the total weighted average return rate equaling approximately 24% in FY07. The average return rate for those agents above the 20% limit equals 39.8%.

2.5.3.2 Condemnation of Expired Charts

The production level for each NACO product is based on historical sales figures. Aeronautical products not sold before their expiration date are kept within the distribution facility and discarded ("condemned") to ensure that obsolete aeronautical information is not made available to the public. In FY07, 266,455 aeronautical products including visual charts, digital products, Enroute charts and books were produced but not sold. This represented a condemnation rate of about 3%.

2.5.4 Digital Product Sales

NACO is not currently able to protect its products from unauthorized reproduction. NACO's digital products are widely shared and can be obtained from unauthorized third party sources at little or no cost. As demand for digital products increases and paper sales decline, it is likely that NACO will have difficulty in sustaining a revenue stream from additional digital product sales.

If NACO were to expand its digital product offering, without copyright protection, to meet changing technology and customer needs, it is possible that NACO would experience a decline in retained receipts as revenue from the sale of digital products may not compensate NACO for

the decrease in the sale of paper products. If NACO is not able to secure copyright protection, other strategies for maintaining this revenue stream will have to be examined. If NACO is not able to maintain this revenue stream, it will experience a decrease in retained receipts and become more dependent on operations funding.

2.5.5 Workforce Retirements/Shortage

Like many federal agencies, NACO faces the challenge of an aging workforce. Approximately 30% of NACO’s employees will be eligible to retire by FY13. Without proper assessment and planning, NACO could face a staffing shortage or staffing misalignment in the next several years. Figure 2.3 depicts the number of staff eligible for retirement by the FY13.

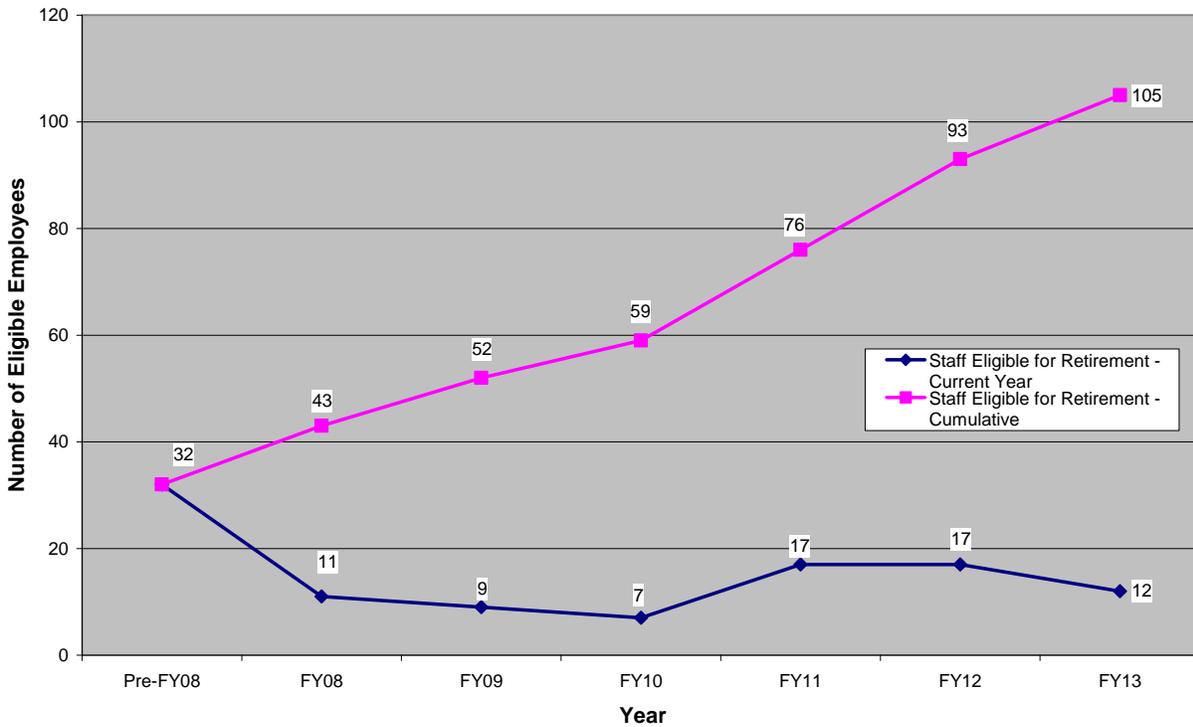


Figure 2.3: NACO Staff Eligible for Retirement

SECTION 3: DESCRIPTION OF ENVISIONED ORGANIZATION

3.1 Work Processes and Performance Improvements

In addition to the analyses performed by the NACO HPO Team, AVN established Integrated IT and Data Services Teams to identify business process re-engineering opportunities across AVN. The teams analyzed current processes and evaluated their alignment with the mission, vision, and goals of the FAA and ATO. Based on these assessments, they developed recommendations for new business processes and a new organizational structure that will significantly improve the efficiency of the organization and its ability to fulfill its mission within AVN.

This section describes the envisioned organization based on the assessments of the HPO Team and Integrated Teams. It is divided into the following three sections:

- **AVN Integration** – Although AVN Integration touches all parts of NACO, this section mainly describes changes to the Aeronautical Chart Team, the Program and Production Management Team, and the Requirements and Technology Team.
- **Reproduction Team** – This section describes all process improvements recommended for the Reproduction Team. It includes some changes recommended by the AVN Integrated Teams but is separated for clarity.
- **Distribution Team** – This section describes the process and staffing changes in the envisioned organization. Changes to the chart agent model are described in Section 3.3.2.

3.1.1 AVN Integration

3.1.1.1 AVN Gold Standard National Flight Data (NFD) Implementation

The AVN “Gold Standard” is an integrated process that will ensure that the data used for the design and development of Instrument Flight Procedures (IFPs) and the associated coded Flight Management System (FMS) data is the same data that is flight inspected, provided for rule making, and published in the NFD. The Gold Standard process will improve the quality and safety of the NFD by ensuring the consistency and integrity of the data throughout the IFP process. The implementation of the Gold Standard will also result in significant cost savings.

In the current process, a commercial contractor provides coded NFD terminal procedures data to NACO employees, who assure the quality of the data. The current contract, which includes the maintenance of RNAVs, SIDs, and STARs, costs \$700K annually and requires 4,500 in-house staff hours for quality assurance. Expanding the current process to include all IFPs (which is planned with the Gold Standard Process) would cost an estimated additional \$500K in contract costs alone. The Gold Standard process will expand the use of IT tools funded through the Instrument Flight Procedures Automation (IFPA) Capital Investment Plan (CIP A14) across AVN. In the new process, the NFD will be maintained from data that is generated using established business rules from a database system that has been quality assured as part of the procedure development and flight inspection processes. See Attachment 1 in Appendix for visual depictions of the current process and the AVN Gold Standard NFD re-engineered process.

Implementation of the Gold Standard Process is already under way, and is nearly complete for RNAV IFPs. To monitor quality improvements with the Gold Standard process, International Organization for Standardization (ISO) quality objectives are being added to the AVN IFP Quality Management System and metrics are being established to measure performance against these quality objectives.

Table 3.1: AVN Gold Standard NFD HPO Savings Summary

Initiative	Current Labor Hours	Savings (%)	Labor Hour Savings	Efficiency Savings	Contract Cost Savings	Supplies/ Equipment Savings
AVN Gold Standard NFD Implementation	14,080	32%	4,500	\$306,000	\$700,000	
AVN Gold Standard NFD Implementation*				\$500,000		
Total Annual Savings (beginning in FY13)	\$1,506,000					
*Cost efficiency from the elimination for additional contracts for ILS and other conventional IFPs not currently under contract. Note: All costs are based on FY08 dollars.						

Implementation Cost for Initiative: In order to realize this significant annual benefit, as shown in the table above, by FY13, the implementation cost of this initiative must be funded prior to the close of FY11.

Table 3.2: AVN Gold Standard NFD HPO Implementation Costs Summary

Initiative	Hardware	Software Procurement	Software Development/ Conversion	Labor/ Contract	Training	Total
AVN Gold Standard NFD Implementation				\$225,000	\$50,000	\$275,000

3.1.1.2 Enroute Chart Automation

NACO currently uses an outdated manual compilation process that relies on contractor support to produce Enroute products. Automating the Enroute production process will improve the accuracy and quality of Enroute products, eliminate the need for contracted compilation support, and reduce labor costs.

The current process for Enroute charting is paper-based and incorporates an extensive amount of manual compilation. Cartographers manually review and apply changes in writing to paper standards. These standards are sent to a contractor who applies the changes and prints the charts. Phase one of this initiative includes creating digital Enroute charts using CAD software. This will enable NACO to compile and maintain the files digitally and provide updates directly to the Reproduction Team. Maintaining these charts digitally will allow NACO to rely on its own resources instead of the current drafting contractor used to maintain the standards. The Reproduction Team will not have to create negatives to support Enroute charting.

The second phase will consist of the creation of a centralized geo-referenced database, which will allow NACO to replace and update multiple production processes. Once this is accomplished, there will no longer be a need for individual databases and individual data maintenance tools. With a central geo-database and a common set of GIS tools, NACO will be able to more easily adapt to new requirements, products and services, and a more demanding digital customer.

Appendix – NACO HPO

The current workload is accomplished by a team of 17 cartographers that maintain the entire Enroute series of charts. Phase one will allow NACO to use in-house resources instead of a drafting contractor, reducing Reproduction Team labor hours and material costs. Once database-driven chart technology has been fully implemented, the same workload will be accomplished with only 10 cartographers, realizing a 41% savings in labor hours. See Attachment 2 in the Appendix for a visual depiction of the Enroute Chart Automation re-engineered process (current and “to-be” workflow).

Table 3.3: Enroute Chart Automation HPO Savings Summary

Initiative	Current Labor Hours	Savings (%)	Labor Hour Savings	Efficiency Savings	Contract Cost Savings	Supplies/ Equipment Savings
Enroute Chart Automation – Phase I	29,920	6%	1,898	\$129,064	\$74,750	\$23,790
Enroute Chart Automation – Phase II	29,920	41%	12,267	\$834,170		
Total Annual Savings (beginning in FY13)					\$1,061,774	

Note: All costs are based on FY08 dollars.

Implementation Cost for Initiative: To ensure the cost efficiency benefit of this initiative is realized by FY13, the implementation cost of this initiative must be funded prior to the close of FY11.

Table 3.4: Enroute Chart Automation HPO Implementation Costs Summary

Initiative	Hardware	Software Procurement	Software Development/ Conversion	Labor/ Contract	Training	Total
Enroute Chart Automation	\$110,000	\$500,000	\$3,125,000	\$750,000	\$100,000	\$4,585,000

3.1.1.3 Airport/Facility Directory Automation

As in the production of Enroute charts, the current process for maintaining and producing the Airport/Facility Directories (A/FD) and supplement products requires extensive manual compilation and contractor support. Automation of the A/FD will utilize commercial off-the-shelf (COTS) software tools to streamline the process, improving quality, reducing in-house labor costs, and eliminating the need for contractor support.

The current process for maintaining the A/FD and supplements involves extensive data review and manual drafting. Aeronautical Information Specialists manually review source data and apply changes in writing to paper standards or manuscripts. These standards are sent to a production contractor that makes all the changes for the next edition of the publication. The current process is not only inefficient, but can lead to multiple errors. Consequently, this process requires additional levels of quality assurance. The re-engineered process will use proven COTS tools to extract data from the FAA’s databases and send completed electronic files to the contractor for printing. See Attachment 3 in the Appendix for a visual depiction of the re-engineered process for the A/FD and supplement products (current and “to-be” workflow).

Table 3.5: A/FD Directory Automation HPO Savings Summary

Initiative	Current Labor Hours	Savings (%)	Labor Hour Savings	Efficiency Savings	Contract Cost Savings	Supplies/ Equipment Savings
Airport/Facility Directory Automation	21,120	50%	10,560	\$718,080	\$200,000	
Total Annual Savings (beginning in FY13)					\$918,080	

Note: All costs are based on FY08 dollars.

Implementation Cost for Initiative: To begin to realize the annual cost savings benefit as shown in the table above, by FY13, implementation of this initiative must be funded no later than FY11.

Table 3.6: A/FD Directory Automation HPO Implementation Costs Summary

Initiative	Hardware	Software Procurement	Software Development/ Conversion	Labor/ Contract	Training	Total
Airport/Facility Directory Automation	\$55,000	\$31,250	\$312,500	\$1,000,000	\$100,000	\$1,498,750

3.1.1.4 Common Airport Mapping Initiative (CAMI)

The Common Airport Mapping Initiative (CAMI) will combine separate airport mapping activities in NACO into a single team, improving the quality of several products and reducing labor costs. Subsequently transitioning to COTS Geographic Information System (GIS)-based technology will provide NACO with the capability to support new FAA requirements for airport mapping products.

Three of NACO’s sub-teams currently perform duplicate airport mapping activities in support of separate NACO products. The Instrument Approach Procedures Sub-Team produces airport diagrams and airport sketches using separate production processes to support the Terminal Procedures Publication. The Aeronautical Information Sub-Team produces airport sketches in support of the A/FD. The Visual Chart Sub-Team produces airport patterns to support visual chart products. This organizational structure results in considerable duplication of effort in the evaluation and application of airport inspection and survey data and the quality assurance of the separate products. Even with strict quality assurance processes in each sub-team, inconsistencies in critical airport data still occur.

The CAMI will improve quality and result in considerable efficiency gains by eliminating duplicative processes (see benefits table 3.7). Using GIS-based technology, a common graphic will be used to generate various airport map products. This will improve product quality by providing consistency in airport data across all chart products. CAMI will also support the creation of new products for use in modern cockpit display systems. These new products would meet existing requirements and directly support the FAA’s goal of reducing runway incursions and improving safety. See Attachment 4 in the Appendix for a visual depiction of the Common Airport Mapping re-engineered process (current and “to-be” workflow).

Table 3.7: CAMI HPO Savings Summary

Initiative	Current Labor Hours	Savings (%)	Labor Hour Savings	Efficiency Savings	Contract Cost Savings	Supplies/ Equipment Savings
Common Airport Mapping Initiative	10,560	33%	3,520	\$239,360		
Total Annual Savings (beginning in FY13)					\$239,360	
Note: All costs are based on FY08 dollars.						

Implementation Cost for Initiative: To begin to realize the annual cost savings benefit as shown in the table above, by FY13, implementation of this initiative must be funded no later than FY11.

Table 3.8: CAMI HPO Implementation Costs Summary

Initiative	Hardware	Software Procurement	Software Development/ Conversion	Labor/ Contract	Training	Total
Common Airport Mapping Initiative	\$22,000	\$15,000			\$10,000	\$47,000

3.1.1.5 Integrated AVN Production Tracking Systems

The integration of the Procedure Tracking System (PTS) and Consolidated Production Control System (CPCS) processes will eliminate redundant databases and data entry procedures, resulting in considerable efficiency gains and improving data quality.

PTS is a centralized database for tracking and managing all IFP projects and tasks. Service area Flight Procedures Offices (FPOs) currently enter data for these projects and tasks into PTS, which tracks them from development through quality assurance, flight inspection, and charting. When the projects and tasks reach the charting stage, NACO’s Charting Team manually enters the project data into the CPCS, which is used to track production, cross-reference data, and assemble the chart data for reproduction. By integrating PTS and CPCS, the IFP data will be transferred electronically from the PTS to the CPCS, eliminating manual data entry and resulting in a faster processing time and greater data accuracy. See Attachment 5 in the Appendix for a visual depiction of the AVN PTS Integration re-engineered process (current and “to-be” workflow).

Table 3.9: Integrated AVN Production Tracking Systems HPO Savings Summary

Initiative	Current Labor Hours	Savings (%)	Labor Hour Savings	Efficiency Savings	Contract Cost Savings	Supplies/ Equipment Savings
Integration of AVN Production Tracking Systems	3,500	98%	3,420	\$232,560		
Total Annual Savings (beginning in FY13)					\$232,560	
Note: All costs are based on FY08 dollars.						

Implementation Cost for Initiative: To begin to realize the annual cost savings benefit as shown in the table above, by FY13, implementation of this initiative must be funded no later than FY11.

Table 3.10: Integrated AVN Production Tracking Systems HPO Implementation Costs Summary

Initiative	Hardware	Software Procurement	Software Development/ Conversion	Labor/ Contract	Training	Total
Integration of AVN Production Tracking Systems			\$625,000		\$75,000	\$700,000

3.1.1.6 Digital Topographic Maps across AVN

Replacing NACO’s manual obstacle plotting procedures with digital processes will reduce the labor hours required for chart production, increase the accuracy of obstacle data, and enable cross-referencing of data with other digital datasets.

NACO currently uses paper quadrangles for plotting obstacle information, extracting elevation data, obtaining city shapes, and charting cultural and physical features. Using paper quadrangles for these activities requires labor-intensive manual manipulation and physical storage space. The USGS Digital Raster Graphics (DRGs) are electronic topographical maps that can be manipulated using a graphical software application. By replacing paper quadrangles with DRGs, NACO will eliminate the need to maintain physical quadrangles and enable cartographers to plot and update obstacle data in digital files. DRGs are maintained electronically and can be replaced as new DRGs become available, eliminating the need for physical storage space. DRGs are also geo-referenced, which makes plotting easier and more accurate and will allow cross-referencing with other digital graphics. See Attachment 6 in the Appendix for a visual depiction of implementing the use of digital topographic maps across AVN (current and “to-be” workflow).

Table 3.11: Digital Topographic Maps HPO Savings Summary

Initiative	Current Labor Hours	Savings (%)	Labor Hour Savings	Efficiency Savings	Contract Cost Savings	Supplies/ Equipment Savings
Digital Topographic Maps across AVN	32,500	13%	4,160	\$282,880	\$8,000	\$56,300
Total Annual Savings (beginning in FY13)	\$347,180					
Note: All costs are based on FY08 dollars.						

Implementation Cost for Initiative: To begin to realize the annual cost savings benefit as shown in the table above, by FY13, implementation of this initiative must be funded no later than FY11.

Table 3.12: Digital Topographic Maps HPO Implementation Costs Summary

Initiative	Hardware	Software Procurement	Software Development/ Conversion	Labor/ Contract	Training	Total
Digital Topographic Maps across AVN	\$220,000	\$62,500	\$300,000		\$50,000	\$632,500

3.1.1.7 AVN Database Integration

As a data-driven organization, NACO’s long-term success depends on the reliability and capacity of the technology it uses. In the context of comprehensive organizational change, NACO will undertake a database integration and system upgrade initiative that will strengthen the organization by eliminating redundant processes and replacing antiquated IT infrastructure with modern systems that are more reliable, easier to operate, have greater functionality, and are compatible with the agency’s IT architecture. The AVN Database Integration initiative will improve the production processes and the overall quality of products that rely on the following source data:

- Obstacle Data
- Airport Data
- NAVAID Data
- Fix/Waypoint Data
- Military Training Route (MTR) Data
- Preferred, Terminal Enroute Control (TEC), and North American Route (NAR) Data
- Airspace Data
- Standard Instrument Departures (SID) and Standard Arrival (STAR) Data

The replacement of the Civilian Airspace Route System (CARS) is a key component of this initiative. CARS is critical to the creation of the DACS and the NavInfo file, which are included on the DAICD. It is also used to generate reports and files in support of NACO charting. CARS is a legacy system that runs on an unsupported VAX 4300 server. The system’s antiquated COBOL programming makes troubleshooting extremely time consuming, imposes limitations on integrity checks needed for quality assurance, reduces the precision of data output, and requires frequent system maintenance. A new version of CARS would utilize data maintained by AVN for airports, NAVAIDs, fixes, airways, SIDs, and STARS as the source for DACS.

The second component of the AVN Integration initiative is the consolidation and enhancement of redundant database systems maintained by NACO and NFPO. NACO currently relies on National Airspace System Resources (NASR)/NFDD, NavCanada, and the National Geospatial-Intelligence Agency (DoD) for the airport and runway data used to create charts, publications, and digital products. The National Flight Procedures Office uses similar sources to maintain the AIRNAV/AVNIS, obstacle, and airspace fix databases in support of flight inspection and flight procedures development. Consolidation of these databases will eliminate redundant data collection and allow AVN to focus efforts on the integrity of fewer data sets. Modernization of these databases to meet AVN requirements is already underway. Once completed, system’s enhanced capabilities will yield significant labor savings and its automated integrity checks will provide an additional layer of quality assurance. The upgrade will also streamline NACO’s procedures for tracking charting updates. Completion of this modernization initiative is

Appendix – NACO HPO

scheduled for 2009. See Attachments 7 thru 14 in the Appendix for a visual depiction of these re-engineered processes (current and “to-be” workflow). System enhancements that will automate and streamline the compilation of MTR, Enroute, airspace, SID and STAR data will result in higher data quality and additional labor savings.

Appendix – NACO HPO

Table 3.13: AVN Database Integration HPO Savings Summary

Initiative	Current Labor Hours	Savings (%)	Labor Hour Savings	Efficiency Savings	Contract Cost Savings	Supplies/ Equipment Savings
AVN Database Integration – Airport Data	606	100%	606	\$41,208		
AVN Database Integration – NAVAID Data	780	94%	730	\$49,640		
AVN Database Integration – NAVAID Radar Data	168	42%	70	\$4,760		
AVN Database Integration – NAVAID Data (CARS Replacement)	280	60%	168	\$11,424		
AVN Database Integration – Fix/Waypoint Data	1,580	55%	865	\$58,820		
AVN Database Integration – Military Training Route (MTR) Data	484	58%	282	\$19,176		
AVN Database Integration – Preferred	1,350	43%	585	\$39,780		
AVN Database Integration – TEC and NAR Data	130	38%	50	\$3,400		
AVN Database Integration – Airspace Data	10,962	33%	3,648	\$248,064		
AVN Database Integration – SID, STAR Data	4,500	100%	4,500	\$306,000		
AVN Database Integration – Obstacle Data (Obstructions added, updated, dismantled OTMS)	32,500		21,396	\$1,454,928		
AVN Database Integration – Obstacle Data (Documentum)	9,750		3,250	\$221,000	\$60,000	
Total Annual Savings (beginning in FY13)					\$2,518,200	
Note: All costs are based on FY08 dollars.						

Summary of Implementation Cost for AVN Database Integration Initiative: Table 3.14 summarizes the implementation cost for the eight sub-initiatives, which fall under the category of AVN Database Integration. The cost reflects an estimated one-time cost, which will ensure the

Appendix – NACO HPO

implementation of the recommended initiative, in order to realize the total annual benefits identified in Table 3.13. To begin to realize the annual cost savings benefits by FY13, implementation of this initiative must be funded no later than FY11.

Table 3.14: AVN Database Integration HPO Implementation Costs Summary

Initiative	Hardware	Software Procurement	Software Development/ Conversion	Labor/ Contract	Training	Total
AVN Database Integration	\$412,500		\$4,875,000	\$1,425,000	\$90,000	\$6,802,500

3.1.1.8 VFR Digital to Plate

NACO currently relies on labor-intensive manual compilation, contractor drafting support, and the use of film negatives to create VFR products. Automation of the VFR production process will improve the precision and quality of visual products, eliminate the need for contracted drafting support, enable NACO to sustain operations as older technology becomes obsolete, and reduce costs from labor and materials.

The current process for visual chart compilation requires NACO’s cartographers to review and apply changes to paper standards by hand. The standards are then sent to a drafting contractor, who compiles the changes and prepares the next edition of each publication. When ready, the Charting Team sends the standards to NACO’s Reproduction Team for the creation of single-line film negatives. Automation of the VFR production process will enable NACO’s Visual Chart Sub-Team to compile visual charts digitally and provide them directly to the Reproduction Team, eliminating the need for contractor support. The use of digital files will also eliminate the negative engraving processes and the need for film, which has become scarce due to innovation in printing technology. See Attachment 15 in the Appendix for a visual depiction of VFR Digital to Plate re-engineered process (current and “to-be” workflow).

Table 3.15: VFR Digital to Plate HPO Savings Summary

Initiative	Current Labor Hours	Savings (%)	Labor Hour Savings	Efficiency Savings	Contract Cost Savings	Supplies/ Equipment Savings
VFR Digital to Plate (Charting Team)	280	100%	280	\$19,040	\$125,000	
VFR Digital to Plate (Reproduction Team)	Reproduction Team Savings Accounted for in Section 3.1.2					
Total Annual Savings (beginning in F13)	\$144,040 (not including Reproduction Savings)					
Note: All costs are based on FY08 dollars.						

Implementation Cost for Initiative: To begin to realize the annual cost savings benefit as shown in the table above, by FY13, implementation of this initiative must be funded no later than FY11.

Table 3.16: HPO VFR Digital to Plate Implementation Costs Summary

Initiative	Hardware	Software Procurement	Software Development/ Conversion	Labor/ Contract	Training	Total
VFR Digital to Plate		\$25,000		\$200,000	\$20,000	\$245,000

3.1.1.9 Standardized Use of Sectional Aeronautical Chart (SRAC) AVN-Wide

NACO currently produces data files for the Instrument Approach Procedures Automation (IAPA) system using a specialized process that requires the creation of a custom color proof. The paper used to create the proof is no longer manufactured and is in limited supply. However, NACO already produces the Sectional Raster Aeronautical Chart (SRAC), a product for public sale that is very similar to the final files used for IAPA. By processing the SRAC for use in the current IAPA/future Instrument Procedures Design System (IPDS) system, NACO will realize savings in labor hours for processing and reproduction as well as materials and conserve its supply of scarce materials. See Attachment 16 in the Appendix for a visual depiction of the use of SRAC re-engineered process (current and “to-be” workflow).

Table 3.17: Standardized Use of SRAC HPO Savings Summary

Initiative	Current Labor Hours	Savings (%)	Labor Hour Savings	Efficiency Savings	Contract Cost Savings	Supplies/ Equipment Savings
Standardized Use of SRAC	370	100%	370	\$25,160		\$1,900
Total Annual Savings (beginning in FY13)	\$27,060					
Note: All costs are based on FY08 dollars.						

Implementation Cost for Initiative: Benefits from this initiative can be realized without any initial investment in the implementation of the new re-engineered process.

3.1.2 Reproduction

3.1.2.1 Pre-Press Process

The pre-press function can achieve significant savings over a five year time frame through its transition from a manual film production process to a digital/Computer-to-Plate (CTP) process. Currently, a large portion of production is associated with manual film processes with an HPO plan to transition to all digital/CTP processes within two to three years. NACO has already started to systematically transition their pre-press production to digital/CTP, with the expectation that all pre-press production will be digital/CTP by FY11. In doing so, NACO will reap significant savings in both labor and material costs. Furthermore, NACO will realize several benefits to the quality and consistency of their products.

Computer-to-plate is an imaging technology used in modern printing processes. This technology allows an image that’s created in a desktop publishing application to be output directly onto a printing plate. Among the many advantages of CTP, other than cost savings, include improved image quality, registration, and consistency, as well as increased productivity.

Going digital while utilizing CTP technology will effectively eliminate all manual processes in the pre-press production process (reducing process cycle time) accounting for approximately

Appendix – NACO HPO

11,000 annual process hours (see Table 3.18). The negative engraving process cycle time (PCT) will be effectively reduced by 23%, the Photo Imaging PCT reduced by 79%, and the Lithography PCT by 62% when the transition is complete (for a total pre-press PCT reduction of 35%). Table 3.18 summarizes the projected processing time reductions throughout the HPO performance period.

Table 3.18: Pre-Press Baseline Cycle Time vs. HPO Cycle Time Requirements

Pre-Press Process Description	Baseline Processing Time (Hrs)	HPO Annual Process Time Requirements					Total Processing Time Reduction (Hrs)	Total PCT Reduction (%)
		Year 1 (Hrs)	Year 2 (Hrs)	Year 3 (Hrs)	Year 4 (Hrs)	Year 5 (Hrs)		
Negative Engraving / Imaging	22,908	21,634	21,108	17,689	17,689	17,689	5,219	23%
Photo Imaging	4,842	2,984	1,435	1000	1000	1000	3,842	79%
Lithography	2,969	1,250	1,115	1,115	1,115	1,115	1,854	62%
Total	30,719	25,868	23,658	19,804	19,804	19,804	10,915	35%
Percent Reduction	--	16%	23%	35%	35%	35%	--	--

3.1.2.2 Press/Printing Process

As part of the HPO effort, the HPO Team conducted a benchmarking study to identify best practices in the printing industry. The team observed press operations at two peer organizations, Jeppesen, a commercial producer and distributor of aeronautical charts, and the Department of the Treasury’s Bureau of Engraving and Printing (BEP), and collected data on presses from Williams & Heintz, a commercial printer that specializes in maps. Press specifications for each organization are included in Attachment 17 in the Appendix.

NACO’s press equipment consists of two five-color sheet-fed offset presses and one two-color sheet-fed offset press. Among the equipment for which data was collected, NACO’s presses are the oldest and have the lowest level of automation. Consequently, NACO’s presses require more pressmen to operate and have a lower printing capacity than those included in the study. Refurbishment or replacement of NACO’s presses would entail significant expenditures. Therefore, in light of the expected long-term decline in demand for paper products, the HPO Team does not recommend additional capital investment.

The optimal staffing level for press operation depends on a combination of factors related to the workload, the characteristics of the products, the number of presses, and the type of presses used. In regard to the type of presses, the level of automation is a critical overarching feature in determining the staffing requirements. While NACO’s presses compare unfavorably to the presses of peer organizations in terms of press speed, paper size, the number of safety features, and level of automation, the HPO Team concluded that the efficiency of NACO’s press staffing could be improved. NACO employed more pressmen per press than any of the peer organizations, in some cases more than twice as many. The HPO Team has determined the following as the optimal staffing level while maintaining safety standards in the press area:

- Reduce the number of full-time press operators of both five-color presses from five to four with one rotating alternate press operator to assist with adjustments, fill in for absent press operators, and provide floor support.

Appendix – NACO HPO

- Decommission the two-color press. Transfer work currently performed on the two-color press to the five-color presses. Eliminate two press operator positions for the two-color press.

Table 3.19 shows the baseline vs. the HPO press area staffing.

Table 3.19: Baseline vs. HPO Press Area Staffing

Description	Baseline FTE	HPO FTE	Comments
2-Color Harris Press	2	0	Press will no longer be used
5-Color Harris Press #1	5	4	Reduced by 20%
5-Color Harris Press #2	5	4	Reduced by 20%
Backup Pressmen	0	1	Back-up added
Supervisor	1	1	No changes
Total	13	10	23% Total FTE Reduction

Refer to Table 3.21 for the projected reduction in press area FTE’s over the entire HPO performance period.

3.1.2.3 Quality Assurance Process

The baseline staffing for the quality assurance (QA) function includes a total of four (4) FTEs. Based on the elimination of USGS workload and more efficient QA practices, it has been determined that the QA function’s most efficient staffing level is two (2) FTEs. Table 3.21 shows the projected reduction in QA staff over the entire HPO performance period.

3.1.2.4 Finishing Process

The baseline staffing for the finishing function includes a total of seven (7) FTEs working on one cutting machine and two folding machines. The staffing in this area is based on the minimum staffing required to operate the machines safely. The capacity of the machines dictates the operational efficiency regardless of staffing. Based on scheduling and minimum staffing required for the machines, the appropriate staffing level is five (5) FTEs (reducing the staff by 2 FTEs) operating the three pieces of equipment. Table 3.21 shows the projected reduction in FTE’s over the entire HPO performance period.

3.1.2.5 Maintenance Process

The baseline staff-hours required for the maintenance function is approximately 4,687 hours. These hours include maintenance duties in negative engraving, photo imaging, lithography, press area, finishing, and Environmental Occupation Safety and Health (EOSH) commitments. In conjunction with NACO’s transition to all digital/CTP processes, an approximate 25% reduction in the maintenance hours from the baseline requirement is anticipated. This digital transition will enable the maintenance group to achieve an optimal staffing level of two (2) FTEs by FY10. Table 3.20 summarizes the approximate change in maintenance workload hours from the baseline to the HPO.

Table 3.20: Baseline vs. HPO Maintenance Requirements

Function	Baseline			HPO		
	% of Time	Hours	FTE	% of Baseline Time	Hours	FTE
Negative Engraving	5%	234	0.13	5%	234	0.13
Photo Imaging	25%	1,172	0.66	0%	0	0.00
Lithography	10%	469	0.26	15%	703	0.40
Presses	50%	2,344	1.32	45%	2,109	1.19
Finishing	5%	234	0.13	5%	234	0.13
EOSH	5%	234	0.13	5%	234	0.13
Total	100%	4,687	2.64	75%	3,515	1.98

3.1.2.6 Management and Support Processes

The baseline staffing level for the management and support of the Reproduction Team was nine (9) FTEs. Due to the Reproduction Team’s overall improvement in work processes, reduction in staffing to the most efficient levels, and work consolidation/reassignment, the appropriate management support staff level in the NACO HPO will be five (5) FTEs (a reduction of 4 FTEs). A projected timeline of this reduction is shown in Table 3.21.

3.1.2.7 Staffing Plan

Based on the reduced process cycle times and an analysis of the work requirements over the HPO performance period, NACO’s HPO will be able to reduce the total FTEs by 33 (a net 47% reduction from the baseline). This will yield a savings of approximately \$3.4M annually (60% cost reduction) once the transition to the new staffing plan is complete (targeted for FY11). Table 3.21 summarizes the FTE requirements and savings over the HPO five-year performance period in each of the reproduction processes. For a detailed staffing plan by position over the performance period, refer to Attachment 18 in the Appendix.

Table 3.21: Reproduction Baseline vs. HPO Staffing Plan & Projected Savings

Process Description	Baseline	HPO Annual FTE Requirements & Projected Savings						Total FTE Reduction	Total % FTE Reduction
	FTE	Year 1 FTE	Year 2 FTE	Year 3 FTE	Year 4 FTE	Year 5 FTE			
Negative Engraving / Imaging	16	13	12	12	10	10	6	38%	
Photo Imaging	13	6	3	2	2	2	11	85%	
Lithography	4	4	2	1	1	1	3	75%	
Management & Support	9	6	5	5	5	5	4	44%	
Presswork	13	10	10	10	10	10	3	23%	
Quality Assurance	4	3	2	2	2	2	2	50%	
Finishing	7	6	5	5	5	5	2	29%	
Maintenance	4	3	2	2	2	2	2	50%	
Total FTE	70	51	41	39	37	37	33	--	
Percent % Reduction from Baseline	--	27%	41%	44%	47%	47%	47%	47%	
Total Cost (millions)	\$5.68	\$4.28	\$3.72	\$3.76	\$3.74	\$3.89	--	--	
Cost Reduction from Baseline (millions)	--	\$1.89	\$2.71	\$2.94	\$3.24	\$3.38	--	--	
% Cost Reduction from Baseline	--	33%	48%	52%	57%	60%	--	--	

3.1.2.8 Materials and Equipment Savings

In addition to the process cycle time reduction from CTP, the digital technology will allow for savings in the maintenance of pre-press equipment and material/supply costs. Total projected HPO annual savings in maintenance and material/supply costs of approximately \$430,000 by FY11 as summarized in Table 3.22:

Table 3.22: Reproduction Materials & Equipment Savings

Cost Driver	HPO Annual Materials & Equipment Savings				
	Year 1 Savings	Year 2 Savings	Year 3 Savings	Year 4 Savings	Year 5 Savings
Maintenance – Image Setters	\$0	\$0	\$105,000	\$105,000	\$105,000
Materials – Film	\$100,263	\$200,525	\$300,788	\$300,788	\$300,788
Materials – Film Chemicals	\$7,380	\$14,760	\$22,140	\$22,140	\$22,140
Total	\$107,643	\$215,285	\$427,928	\$427,928	\$427,928

3.1.2.9 HPO Implementation Costs for Reproduction

The transition from manual pre-press processing to the use of CTP technology will require the purchase of an additional CTP machine by FY10 to support NACO’s current transition schedule. At an estimated cost of \$300,000, NACO is expected to recover the investment in less than one year through maintenance contract and materials savings directly attributable to CTP, as shown in Table 3.22.

3.1.3 Distribution

3.1.3.1 Inventory Management and Quality Assurance (IMQA)

The baseline staffing for IMQA consists of a total of five (5) FTEs. This includes four (4) Inventory Specialists and one (1) Team Leader. IMQA is responsible for managing the warehouse inventory for FAA aero, DoD aero, DoD nautical and NOAA nautical, and forecasting print quantities for FAA aero and NOAA nautical products. There are currently two (2) Inventory Specialists responsible for DoD aero and DoD nautical products, along with other FAA products. With the elimination of DoD aero and DoD nautical products in FY10, IMQA will have a decrease in workload resulting in a reduction in staff by one (1) FTE, leaving a total of four (4) FTEs in FY11. Refer to Table 3.23 for the projected reduction in FTEs over the entire HPO performance period.

3.1.3.2 Agents/Government Sales and Services Sub-Team

The Agents/Government Sales and Services Sub-Team is responsible for the all aspects of the product ordering process, including setting up chart agent or Government agency accounts, processing orders, and collecting payments. The baseline staffing for the Agents/Government Sales and Services Sub-Team is 12 FTEs. There are 10 sales representatives in the group—seven (7) in charge of chart agent accounts and three (3) in charge of government agency accounts.

As of FY07, NACO's chart agent network is comprised of approximately 500 nautical and 2,000 aeronautical chart agents located throughout the U.S., as well as in a number of other countries. As part of this HPO, a new chart agent model, which will reduce a number of agents, is described in Section 3.3.2. Implementing these recommendations will allow the Agents/Government Sales and Services Sub-Team to reduce by seven (7) FTEs, yielding an average annual savings of \$440,000 by FY11. Table 3.23 in the Staffing Plan section shows the projected reduction in FTEs over the entire HPO performance period. For more information regarding the proposed chart agent model, refer to 3.3.2.

3.1.3.3 Public Sales and Services Sub-Team

Streamlining the ordering process towards utilizing e-commerce will reduce the time intensive ordering options such as phone, email and fax orders. This will increase efficiency for public sales representatives to process orders and decrease their workload. This decrease workload will result in a projected reduction of three (3) FTEs in the Public Sales and Services Sub-Team by FY11. Table 3.23 in the Staffing Plan section shows the projected reduction in FTEs over the entire HPO performance period.

3.1.3.4 Distribution Team Support Staff

The Distribution Team support staff consists of management and support staff for all functions of the Distribution Team. The baseline staffing for the Distribution Team is a total of seven (7) FTEs. This includes one (1) Distribution Analyst Supervisor, two (2) Distribution Analysts, one (1) Financial Analyst, one (1) Management & Program Analyst, one (1) Logistics Management Supervisor and one (1) Traffic Management Specialist. Since the baseline period, one of the Distribution Analysts left the team and the position was not backfilled. With the reductions in the other groups, the Distribution Team will be able to reduce staffing by one (1) FTE (Distribution Analysis) for a total of six (6) FTEs and will continue with the current staffing level through FY11. The reorganization of NACO and NFPO into the National Aeronautical Information

Appendix – NACO HPO

Service (NAIS) is planned within FY09/FY10 time frame (see Section 3.2.3), eliminating duplicative staff positions. Therefore it is estimated that two (2) of the administrative positions will be eliminated after the reorganization to NAIS by FY13, which brings the original Distribution Team support staff to three (3) FTEs. Table 3.23 in the Staffing Plan section shows the projected reduction in FTEs over the entire HPO performance period.

3.1.3.5 Staffing Plan

Based on the proposed chart agent model, the requirement that chart agents use e-commerce for placing orders, and the anticipated increase of online orders from the public, NACO will be able to reduce the Distribution Team staff by 14 FTEs within the HPO performance period. This equates to a 39% reduction in staff and a savings of \$1,094,323 over the five-year period, which is a 43% cost savings from the baseline. Table 3.23 summarizes the FTE requirements and savings over the HPO five-year performance period in each of the Distribution processes. For a detailed staffing plan by position over the performance period, refer to Attachment 19 in the Appendix.

Table 3.23: Distribution Baseline vs. HPO Staffing Plan & Projected Savings

Process Description	Baseline	HPO Annual FTE Requirements & Projected Savings						
	FTE	Year 1 FTE	Year 2 FTE	Year 3 FTE	Year 4 FTE	Year 5 FTE	Total FTE Reduction	Total % FTE Reduction
Distribution Team	7	6	6	6	6	4	3	43%
IMQA	5	5	5	4	4	4	1	20%
Agents/Government Sales & Services Group	12	10	8	6	5	5	7	58%
Public Sales & Services Group	12	11	10	9	9	9	3	25%
Total FTE	36	32	29	25	24	22	14	--
Percent % Reduction from Baseline	--	11%	19%	31%	33%	39%	39%	39%
Total Cost (millions)	\$2.51	\$2.44	\$2.36	\$2.18	\$2.21	\$2.12	--	--
Cost Reduction from Baseline (millions)	--	\$0.29	\$0.48	\$0.78	\$0.87	\$1.09	--	--
% Cost Reduction from Baseline	--	12%	19%	31%	35%	43%	--	--

3.1.4 New and Increased Work Requirements

Beginning in FY09 and continuing beyond FY13, NACO/AVN will be able to meet documented growth in existing work, as well as, meeting requirements for new products and services. Furthermore, this additional and significant increased workload will be met without increasing existing resources. The annual labor hour savings described in Section 3.1.1, AVN Integration, will be re-directed towards the new and increased workload requirements. Without the HPO

labor hour savings, NACO would need to increase staff by a substantial amount, subsequently increasing its operating cost. The following describes the new and increased work requirements.

3.1.4.1 Enroute Automation Modernization (ERAM)

The ERAM Development Contractor (Lockheed Martin) has specified that Enroute aeronautical data be provided in an industry standard ARINC 424 data format for support of the ERAM system. The AVN produced NFD product is in this format, but additional enhancements/additions are required for the NFD to meet the ERAM requirements for international data for Mexico, Canada, the Caribbean, Pacific, and Atlantic. In order to accomplish this additional workload, resources will need to be shifted to this activity (see Table 3.24 for level of effort). Although not included as part of the NACO HPO savings benefit, this NACO initiative will result in a considerable cost savings to the FAA ERAM Program Office. This agency savings is based on eliminating the ERAM Program Office having to procure the data from commercially available data sources at a very high cost of over \$850K annually. The additional annual workload requirements to be funded within the AVN program are shown in Table 3.24.

Table 3.24: Additional Annual ERAM Workload Requirements and Cost

FY13 and Beyond Requirements	Annual Labor Hours	Annual Cost of New Workload
Enroute Automation Modernization (ERAM)	1,040	\$70,720

3.1.4.2 Common Airport Mapping Initiative (CAMI)

There is a critical need to reduce runway incursion accidents and incidents, and this target has been reflected in FAA Flight Plan Goals for a number of years. One of the key cornerstones to reducing runway incursions is for aircraft crews to have up-to-date airport surface movement diagrams/maps to use while taxiing in low visibility, low light, or unfamiliar conditions. For optimum safety, these surface movement diagrams should also be provided in an electronic display showing the aircraft’s position on highly accurate airport surface diagrams. Creation of such needed digital detailed airport surface movement charts is a significant safety benefit, and will provide the airport surface information necessary to directly support high level FAA Flight Plan Goals for reduction of runway incursions. The additional annual workload requirements to be funded within the AVN program are shown in Table 3.25.

Table 3.25: Additional Annual CAMI Workload Requirements and Cost

FY13 and Beyond Requirements	Annual Labor Hours	Annual Cost of New Workload
Common Airport Mapping Initiative	3,520	\$239,360

3.1.4.3 Obstacle Repository System (ORS)

Within the FAA there is a critical need for comprehensive obstacle data to support instrument procedure design, charting, and air traffic control required MSAW and MVA production. Although different, all of these products are dependent on a comprehensive obstacle information source. Within AVN there are currently two different obstacle databases, which contain (with some overlap) obstacles of interest for specific production needs. In addition, there is a significant backlog of obstacle accuracy determinations for obstacles, which impact procedure

design and also have charting impact. In order to meet AVN production requirements in an efficient manner, AVN needs to integrate obstacle databases, resolve conflicts between internal obstacle databases, and make progress on resolving the current growing back-log of existing unverified obstacles that impact instrument procedure design and charting. The additional annual workload requirements to be funded within the AVN program are shown in Table 3.26.

Table 3.26: Additional Annual ORS Workload Requirements and Cost

FY13 and Beyond Requirements	Annual Labor Hours	Annual Cost of New Workload
ORS Increasing Workload	11,958	\$813,144
ORS Backlog of Obstacle Input	17,936	\$1,219,648
Total	29,894	\$2,032,792

3.1.4.4 New Aeronautical Chart Products

Due to changes to the NAS and as the result of new FAA charting requirements there will continue to be a need to develop new aeronautical chart products to support both air traffic operations and U.S. aviation needs. Some recent examples of new charting requirements include the development and support of FAA IFR Enroute charts to replace DoD canceled charts of the Caribbean, Pacific and Atlantic areas, development of new VFR Terminal Area Charts, and development of new off-shore IFR charts to support efforts such as the West Atlantic Route System (WATRS). These on-going chart development requirements will continue to demand NACO support in the future. The additional annual workload requirements to be funded within the AVN program are shown in Table 3.27.

Table 3.27: Additional Annual Workload from New Aeronautical Charts

FY13 and Beyond Requirements	Annual Labor Hours	Annual Cost of New Workload
New Aeronautical Chart Products	922	\$62,719

3.1.4.5 Radar Video Maps (RVM)

Production of RVMs is critical for supporting Terminal Air Traffic operations. The production of RVMs, which is funded by ATO-T, has been expanding for many years. The increase in the number of RVMs produced each year is attributed to the introduction of Performance-Based Navigation (PBN) terminal procedures into the NAS, as well as the deployment of new Air Traffic Control (ATC) systems to high impact airports (e.g., STARs), and the shifting of older ATC systems to smaller airports not previously serviced by radar. NACO has been tracking the number of RVMs produced for many years, and based on this historical data they have projected that the workload will increase by about 300 RVMs a year for the next 5 years. NACO’s projection is substantiated by planned increases in FAA Flight Plan goals for PBN terminal procedures over the next several years. The additional annual workload requirements to be funded outside the AVN program through separate Ops Funding are shown in Table 3.28.

Table 3.28: Additional Annual RVM Workload

FY13 and Beyond Requirements	Annual Labor Hours	Annual Cost of New Workload
Radar Video Maps (RVM)	14,256	\$969,408

3.1.4.6 Increase in New and Amended Instrument Flight Procedures and Non-Procedures Revisions

Due to the growth in the aviation industry, National Airspace System (NAS) traffic is expected to continue increasing over the next 20 years, increasing the risk of flight delays, schedule disruptions, choke points, and inefficient flight operations, particularly when inclement weather and other factors impact airport capacity.

Through NextGen, the FAA is addressing the impact of traffic growth by increasing NAS capacity and efficiency while simultaneously improving safety, environmental impacts and user access to the NAS. The FAA is implementing new routes and procedures that leverage emerging aircraft navigation capabilities.

In support of increasing the capacity of the NAS and the Agency’s NextGen initiative, the Agency is requesting to increase the current production rate of Performance-Based Navigation IFPs (i.e., Required Navigation Performance – RNP, Wide Area Augmentation System – WAAS) as early as 2008 and is expected to continue expanding at an increasing rate over the next 20 years.

After the publication of the IFP, AVN is responsible for life-span maintenance of the procedure. An IFP must be continually maintained until it is cancelled. IFP amendments are an integral part of the continual maintenance activity. Amendments or revisions are issued based on various changes, which occur after an IFP is published. Examples are user/customer request changes, criteria changes, new obstacle constructions, airport infrastructure changes, magnetic variation changes, and navigational aid facility relocations.

As IFP production increases and inventory continues to expand, the number of required amendments will increase at an equivalent rate. Historically, the NFPO has accumulated a large backlog of IFP maintenance workload. As the IFP development and revision process is automated, this backlog will be accomplished by increasing the current rate of production to be worked by NACO.

Based on a historical trend on the increase of non-procedural revisions over the last several years, a 12% increase is expected for at least the next 20 years. Factors that play a role in the need to make a non-procedural change to a chart product are as follows: any change at an airport; a communication type of change; airport construction; or an enhancement to a communication system; etc.

With the efficiency gains realized from the process re-engineering activities identified in this document, this additional workload can be accomplished without any additional staffing, thus creating a cost avoidance as shown in Table 3.29.

Table 3.29: Additional Annual Workload from IFP and Non-IFP Revisions

FY13 and Beyond Requirements	Annual Labor Hours	Annual Cost of New Workload
Increase in Original IFP Workload	4,200	\$285,600
Increase in IFP Amendment Workload	8,610	\$858,480
Increase in Non-Procedural Revision Workload	21,578	\$1,467,314
Total	34,388	\$2,338,394

3.2 Organizational Chart and Staffing

3.2.1 NACO / NFPO Process Integration

The NACO HPO will merge with the NFPO by FY10, creating a new organizational structure. This new structure will be an integral part of the implementation of the AVN Integration Initiatives described in Section 3.1.1. Business process re-engineering efforts supported by developing and planning for new information technologies will facilitate the integration of most activities within NACO and NFPO. Sophisticated IT systems with built in business rules will require staff in both organizations to have a common set of higher IT and aeronautical information skills, and less manually-oriented specialized cartographic and procedures development skills. Through this initiative, the number of FTEs in these organizations will be reduced. The resulting integrated organization will reduce costs, increase production capacity, and improve quality. Integration will also result in shorter delivery times to customers, and lower unit costs for products and services. The NACO HPO and NFPO combination will occur in two phases.

3.2.2 Phase One – HPO Organization Chart and Staffing

Phase one of the HPO will occur in FY09. This phase of the integration effort will combine all IT planning, data services, and digital product planning and development into a single Integrated IT and Data Services Team (refer to Attachment 20 in the Appendix for the Phase 1 ‘to be’ organizational chart). This organizational structure will support all IT planning and development necessary to support this HPO Plan. It will ensure that AVN systems and processes are properly integrated and designed consistent with the NAS IT Enterprise Architecture and future FAA/ATO data stewardship/federated database model requirements. This organizational structure is also necessary to support many of the re-engineered processes presented in the HPO Plan, which eliminate duplicate data maintenance work/processes and streamline production processes of digital products.

3.2.3 Phase Two – NACO HPO/NFPO Integration

The second phase, to be implemented in FY10, will integrate all production components and associated staff support in NACO and NFPO. This organizational structure supports a next level of business process re-engineering where all activities from development through publication (except flight inspection) involving Terminal and Enroute Instrument Flight Procedures as well as Visual Aeronautical Charts and support products are integrated in a single team (refer to Attachment 21 in the Appendix for the Phase 2 “to be” organizational structure). This organization, to be called the National Aeronautical Information Service (NAIS), will support a further reduction in FTEs beyond the initiatives presented in the HPO Plan through more efficient allocation of work and the elimination of overlapping activities. Work activities currently divided into specialized skill areas with some overlapping activities, can be assigned to a single team with common IT and aeronautical information skill sets. These streamlined processes will also improve quality by ensuring that consistent data is used throughout the production process.

The current process for Enroute airways is a good example of how NACO and NFPO have overlapping activities. Currently, NACO receives requests from the ATO-Airspace and Rules Group to validate airway change proposals prior to Notice of Proposed Rule-Making publication. In addition to providing certification of the proposed description, NACO also provides air traffic with graphics of the proposed changes. NACO reviews airway changes throughout the regulatory

process and upon final rule publication in the Federal Register updates its airway data files in support of DACS, NFD, and NACO charting. NACO reviews all supporting airway data such as fixes, NAVAIDs, and altitudes to ensure accurate and timely publication concurrent with airway publication. The NACO Airspace Section is also required to identify all NACO charts and create/provide the charting sections with airway change lists confirming published changes. At about the same time NACO is working airway proposals, specialists at the NFPO are using TERPS to certify airway requirements prior to flight check and publication of airway changes. This responsibility includes creation of 8260-2 and 8260-16 forms for airway fixes and altitudes. The current processes are not in harmony with each other and need to be improved.

Combining administrative support staffs within NACO, and between NACO and NFPO, would recognize further reductions in FTEs. There are currently three separate administrative groups within NACO alone performing similar administrative services, in addition to the duplication between NACO and NFPO. Through the elimination and restructuring of the current management levels at NACO, additional FTE's could be reduced, further meeting the FAA organizational guidelines. See Attachment 21 in the Appendix for a depiction of Phase II.

Benefits: An annual cost savings benefit of \$1.54M will be realized as early as FY13 by implementing the proposed re-organization. Implementing the proposed organization in phases will allow for a phased reduction in FTE for a total reduction of 12 in NACO (18 total) by FY13.

Implementation Cost for Initiative: The implementation cost for this initiative is primarily to cover an increase in PC&B, which will occur with the proposed restructuring of management, position types, and position grades. The cumulative cost for this initiative covering the period from FY09 through FY13 will be \$2.2M. The increased PC&B will be a phased increase and is offset by a planned phased attrition rate beginning in FY11.

3.3 Business Model and Strategy

3.3.1 Pricing Model – Paper Based Products

To account for an FY07 recoverable cost shortfall of approximately \$14M, the HPO Team developed a pricing methodology and recommended new prices for NACO's line of paper products. The team also recommended new, standardized discount rates for customer groups, subscriptions, and product sets to simplify pricing, increase revenues, reduce waste, and encourage bulk and advance orders.

3.3.1.1 Pricing Model Methodology

The pricing model methodology developed by the HPO Team is based on the principle of recovery of allowable costs pursuant to Public Law 106-181. Using production, sales, and cost data from FY06 and FY07, the team calculated prices for NACO's paper products that would fully recover allowable costs for sales to public customers. The team then adjusted each product's price according to two factors: how far below the calculated price the current price was, and the estimated price sensitivity of the product's primary customer groups. In the long term, the HPO Team envisions that NACO will continue to evaluate prices annually, adjusting them as necessary to minimize the gap between recoverable costs and revenues.

3.3.1.2 New Discount Structure by Customer Segment

During FY07, NACO offered discounts ranging from 10% to 100% (free) to customer groups representing three major categories—the general public, DoD, and the FAA (internal customers). The HPO Team reviewed the discount structure for each customer group and proposed several changes with the goal of increasing total revenue.

3.3.1.2.1 DoD Discount Structure

The DoD is NACO's single largest customer group, purchasing nearly 50% of NACO products during the last two years. In FY07, DoD received a weighted average discount of 86% on paper products. While NACO produces some products on behalf of DoD and benefits from DoD's cooperation in the production of others, the HPO Team was unable to justify offering a higher discount to DoD than to other federal agencies. Consequently, the team recommended that DoD's discount be reduced to 40%, the rate offered to NACO's other federal customers.

3.3.1.2.2 Chart Agent Discount Structure

Chart agents, who purchase products from NACO and resell them for profit, represent the single largest public customer group and benefit from a 40% discount on NACO products. Although the discount structure remains the same for chart agents, the model as a whole has been improved significantly for the HPO. Section 3.3.2 contains a complete description of the changes made to the chart agent agreement.

3.3.1.2.3 FAA and Other Government Agencies Discount Structure

Prior to the HPO initiative, FAA customers received NACO products at no cost and without restriction. As a result, NACO filled a significant number of standing orders from FAA customers without being able to verify receipt or use of the products. Furthermore, NACO was forced to bear the full cost of products ordered for FAA use. In order to increase accountability and reduce waste, it was recommended that NACO institute a pricing structure for internal customers at a 40% discount beginning in FY09. NACO stands to benefit from increased revenues and the expected reduction in unused charts will reduce costs to the FAA as a whole. The 40% discount for FAA internal customers will be the same discount offered to all other federal agencies.

3.3.1.2.4 Special Price Groups

Among the other customer groups, there was little opportunity for a significant increase in revenue through changes to the discount structure. Federal law requires that free charts be distributed to the Federal Depository Libraries, the Library of Congress, Congressional offices, and the National Archives. The team recommends, where products are available on digital media, NACO should provide these products in the format with the lowest cost. Public schools and libraries represent a very small percentage of sales with a 10% discount. All other public customers, including private citizens and commercial enterprises, pay full price for NACO products.

3.3.1.3 New Pricing Structure for Subscription and Sets

Prior to the HPO initiative, NACO offered a range of discounts on subscriptions. Subscriptions are orders for multiple editions of a single product or a set of products to be issued over a period of six months or a year. They require payment at the time of sale. Subscription sales require less effort in terms of customer service support and payment collection than processing multiple one-time sales from the same customer. Recognizing this, the HPO Team sought to raise prices and standardize subscription discounts while at the same time maintaining prices at a level that would

encourage purchases of subscriptions. To reduce order processing time and costs, the team also instituted a discount for full product sets.

The process for adjusting subscription prices involved two steps. First, the team recalculated subscription prices based on the new prices established for constituent products. The team then applied a discount of 0% (no discount), 10%, 20%, or 40% to the subscription price depending on the following factors: the number of editions or items in the subscription, the price sensitivity of the primary customer groups, the availability of alternatives, and the discount currently offered for the subscription. As a result of this process, the average discount on subscriptions increased from 12.3% to 14.6%. A 10% discount was applied to full product sets.

3.3.1.4 Projected Impact of New Pricing Structure

Production, sales, and cost data for paper products from FY06 and FY07 were used to estimate the effect of changes to the pricing structure on revenues given historical demand. The team projects the new pricing structure will increase revenues by up to \$11.8M (if demand remains stable), thus reducing the recoverable gap from approximately \$12.3M down to nearly zero, maximizing overall allowable cost recovery. The \$11.8M revenue projection is based on the new pricing and discount structure against the FY07 demand for each customer group. However, to account for the transition time/delays to the new structure and any decreased demand, a more conservative revenue projection of \$8.9M (75% of maximum revenue projection) is anticipated. The increased revenue projection and reduced recoverable gap is in-line with the legislation mentioned earlier (Public Law 106-181) on what NACO is allowed to recover. Table 3.30 summarizes the projected impact of the new pricing structure on paper products.

Table 3.30: Projected Impact of New Pricing Structure

Customer Group	FY07 Production Cost (A)	FY07 Recoverable Cost (B)	FY07 Non-Recoverable Cost (C)	FY07 Revenue (D)	FY07 Recoverable Gap (B + D)	Projected Revenue (E)	Projected Recoverable Gap (B + E)
FAA	(\$2,663,072)	(\$2,103,042)	(\$560,030)	\$0	(\$2,103,042)	\$2,492,836	\$389,794
DoD	(\$14,596,624)	(\$11,332,513)	(\$3,264,111)	\$3,863,610	(\$7,468,903)	\$8,566,231	(\$2,766,282)
Chart Agents	(\$14,804,015)	(\$11,307,845)	(\$3,496,170)	\$10,568,897	(\$738,948)	\$11,542,452	\$234,607
Public (Full Price)	(\$4,915,097)	(\$3,993,060)	(\$922,037)	\$2,969,185	(\$1,023,874)	\$6,438,577	\$2,445,517
Public 40%	(\$471,505)	(\$375,044)	(\$96,462)	\$201,338	(\$173,705)	\$399,134	\$24,090
Public 10%	(\$31,798)	(\$25,704)	(\$6,093)	\$20,783	(\$4,921)	\$40,792	\$15,088
Free and Replacement	(\$1,023,793)	(\$759,482)	(\$264,311)	\$0	(\$759,482)	\$0	(\$759,482)
Total	(\$38,505,903)	(\$29,896,689)	(\$8,609,214)	\$17,623,814	(\$12,272,875)	\$29,480,022	(\$416,667)

3.3.2 Chart Agent Model

To meet the goals of aeronautical safety first, NACO’s products are currently available to public customers worldwide through mail, telephone and Internet orders. NACO’s chart agent network increases the distribution of aeronautical products by providing additional points of sale in areas frequented by NACO’s customers, such as airports and flight schools. This model allows chart retailers to determine the extent of additional distribution. However, they are not allowed to sell to other businesses that will resell the products (known as Sub-Agents). Furthermore, chart agents are free to determine which NACO products they sell without restriction to the public.

Appendix – NACO HPO

Currently, NACO offers chart agents a 40% discount, which creates an opportunity for profit, and the ability to return obsolete merchandise for credit, which reduces the risk to the agent from fluctuations in sales. The credits from returned merchandise are applied towards future agent purchases, thus reducing NACO's revenue.

3.3.2.1 Evaluating the Current Chart Agent Model

In FY07, NACO's chart agent network was comprised of approximately 500 active nautical and 2,000 active aeronautical chart agents located throughout the U.S., as well as in a number of other countries. Average net sales per aeronautical chart agent in FY07 were just under \$4,700, an increase of about \$150 over FY06. However, sales in both years were heavily weighted toward the largest aeronautical chart agents. In FY07, the highest-selling 3% of aeronautical chart agents accounted for 50% of all aero chart agent sales, with the six highest-selling agents alone accounting for about 30% of sales. Net sales per nautical chart agent were \$4,348 in FY07, a slight decrease from FY06. Nautical chart agent sales were also weighted toward the largest agents, with the five highest selling agents accounting for 32% of sales.

3.3.2.1.1 Average Return Rate

In FY07, nearly half of all aeronautical chart agents (1,021) had returned more than 20% of products purchased, reducing NACO revenue and violating the chart agent agreement. The average return rate among all aeronautical chart agents was greater than 24% in FY07. The average return rate for those agents above the 20% limit equals 39.8%. Since returns cannot be resold, NACO bears the full cost of initial production and distribution of those charts returned. In FY07, the cost of returns above the 20% level was approximately \$750,000 for aeronautical chart agents.

3.3.2.1.2 Number of Agents below Sales of \$500

In FY07, approximately 20% of all aeronautical chart agents had yearly net sales below \$500. This number represented an improvement of about 3% from the previous year. Slightly more than 30% of nautical agents had less than \$500 in sales in FY07, also an improvement from FY06. The administrative expenses of maintaining the chart agent model consist of sales materials, the production of agent newsletters, new agent kits, special notices, other communication, and shipping costs.

3.3.2.2 HPO Chart Agent Model

NACO recognizes that a wide dissemination of aeronautical and nautical navigation data is critical to ensuring the safety of air and sea travel. Therefore, in addition to selling products directly to the public through NACO's web site, NACO maintains a network of chart agents to ensure that aeronautical and nautical navigation products are widely available. In order to enhance the chart agent model to run in a lean and efficient manner in-line with HPO goals, the following changes will be made:

- Ensure strict compliance with the current return policy by denying credit to chart agents that return 20% or more of merchandise ordered. Based on FY07 quantities, this will achieve an estimated savings of nearly \$750,000 per year.
- Increase chart agents' minimum sales requirement from \$500 to \$5,000 per year. By increasing the minimum sales requirement, NACO will provide agents with an incentive to

Appendix – NACO HPO

increase sales. This change will also reduce the total number of agents, thereby reducing the number of staff NACO needs for contract administration and records maintenance.

- Require chart agents to place orders online. This will consolidate sales records and eliminate the need for customer service representatives to take orders by telephone.
- Permit chart agents to create Sub-Agent networks allowing smaller businesses, which do not meet the new minimum requirements, to continue to sell NACO products. Chart agents are currently prohibited from reselling NACO's aeronautical and nautical products to other vendors.
- Conduct a survey every six months to solicit feedback and monitor chart agents' satisfaction with NACO's service. Chart agents are a significant component of NACO's current public distribution strategy and are uniquely able to collect information about the public's demand for aeronautical and nautical products. NACO should utilize chart agents to increase the NACO's responsiveness to public demand as well as to ensure that NACO is providing the agents themselves with the resources they need to distribute NACO's products.

The team recommends a phased implementation of the changes above to ease the chart agents' transition to the new requirements. As a first step, the Distribution Team will begin notifying chart agents of the impending changes to the chart agent agreement by October 1, 2008. Chart agents will be given one year to demonstrate their ability to comply with the new requirements. Beginning on October 1, 2009, agents will be required to sign and abide by the new agreement. The projected HPO savings from this new chart agent model are summarized in Table 3.31.

Table 3.31: Agent Model Projected Annual HPO Savings

Expense Type	HPO Annual Savings
Returns above 20%	\$750,000
Distribution Staff FTE	\$375,000
Administrative Expenses	\$107,800
TOTAL	\$1,232,800

3.3.3 Miscellaneous

3.3.3.1 DoD Catalogs

By the beginning of FY10, NACO will no longer sell DoD aeronautical or nautical products. NACO currently produces and distributes a catalog for both DoD aeronautical and nautical products at an annual cost of nearly \$100,000. Based on the FY07 figures, the expected annual savings from discontinuing the DoD catalogs is expected to be approximately \$100,000 over the HPO period (starting FY10). Table 3.32 summarizes the savings from the elimination of DoD catalogs.

Table 3.32: DoD Catalog Elimination Savings Summary

DoD Catalog Description	FY 2007 Quantity	FY 2007 Costs	Cumulative Expected Savings (FY 2010-13)
DoD Aeronautical Catalog	5,052	\$8,707	\$34,828
Production		\$6,668	
Distribution		\$2,039	
DoD Nautical Catalog	34,844	\$90,536	\$362,144
Production		\$47,389	
Distribution		\$43,147	
Total	39,896	\$99,243	\$396,972

3.3.3.2 Facility Space Savings

NACO’s printing and distribution operations are currently housed in a 142,810 ft² facility in Glenn Dale, Maryland. The building is owned by the General Services Administration (GSA) and leased by NACO at a cost of \$2.97M per year. Approximately 29,008 ft.² of NACO’s warehouse space is currently occupied by DoD products, which NACO currently distributes, and supplies for the Reproduction Team’s Photo Imaging Sub-Team. The annual cost of this space is nearly \$605,000. As of FY10, NACO will no longer distribute DoD products, and the changes to NACO’s pre-press processes will eliminate the need for photo imaging supplies. NACO will be able to return the unoccupied space to the GSA for an annual savings of approximately \$605,000. Table 3.33 summarizes the savings.

Table 3.33: Space Savings Summary

Space Description	Square Footage	Annual Cost
Glenn Dale Facility (DoD warehouse space and Reproduction space)	29,088	\$604,956

3.3.3.3 Facility Services Savings

NACO currently provides space in its Glenn Dale and Silver Spring facilities to the FAA ATO-A. Although ATO-A currently pays NACO for the use of the space, ATO-A does not pay for any portion of the services associated with these facilities, such as security and on-site health care. The HPO Team recommends that NACO begin charging ATO-A for these services in proportion to the amount of space leased and the number of employees on-site. In doing so, NACO would save approximately \$194,000 annually beginning in FY09. Table 3.34 shows the potential benefit to NACO from recovering these facilities service costs.

Appendix – NACO HPO

Table 3.34 Facility Service Costs Summary

Facility Service	Total Cost	ATO-A Share (%)	ATO-A Share (\$)
<i>Glenn Dale, MD Facility</i>			
Service Contract Cost	\$512,528	18.85%	\$96,624
Nursing Service Cost	\$9,784	10.28%	\$1,006
Glenn Dale Sub-total	\$522,312		\$97,630
<i>Silver Spring, MD Facility</i>			
Security Service	\$641,388	9.59%	\$61,504
Security System Maintenance	\$23,203	9.59%	\$2,225
Security System Service Center	\$25,757	9.59%	\$2,470
Health Unit Services	\$24,255	8.44%	\$1,995
Above Standard Electrical	\$211,000	9.59%	\$20,233
SSMC Operating Costs	\$38,845	9.59%	\$3,725
Internal Mail Service	\$31,630	15.23%	\$4,819
Silver Spring Sub-total	\$996,078		\$96,971
TOTAL	\$1,518,390	--	\$194,601

SECTION 4: EXPECTED SAVINGS, PERFORMANCE TRACKING AND CONTROL, IMPLEMENTATION, AND CONTINUOUS IMPROVEMENT

4.1 Expected Savings/Financial Impact and Costs

4.1.1 Expected Savings/Financial Impact

The NACO HPO will realize significant savings throughout the five-year time frame, with year five realizing the most savings. The year five annual savings of \$15.2M is expected to continue on an annual basis beyond the HPO performance period. In addition, the new pricing structure will increase revenues annually by a projected \$8.9M. As NACO implements the HPO initiatives, an annual total financial impact of approximately \$24M (cost savings plus increased revenue) is projected by FY13. Over the entire five year HPO performance period, estimated cumulative impact is projected at \$90M. The final year savings from the baseline cost estimate is approximately 28%. The increased revenue from the new pricing model is expected to continue after the five year HPO time frame at least in the short term until further analysis of digital pricing impact can be achieved. Table 4.1 summarizes the entire HPO projected cost savings and total financial impact, and Table 4.2 summarizes the FTE savings.

Table 4.1: Summary of Total HPO Savings and Financial Impact

		Projected Annual and Cumulative Benefit from HPO (millions)					
Section	Description	Year 1 (FY 2009)	Year 2 (FY 2010)	Year 3 (FY 2011)	Year 4 (FY 2012)	Year 5 (FY 2013)	Total 5 year (\$)
3.1.1	AVN Integration	\$0.30	\$1.80	\$3.00	\$5.00	\$7.00	\$17.10
3.1.2	Reproduction	\$2.00	\$2.93	\$3.37	\$3.67	\$3.80	\$15.77
3.1.3	Distribution	\$0.29	\$0.48	\$0.78	\$0.87	\$1.09	\$3.51
3.2.3	NACO/NFPO Integration	\$0.00	\$0.00	\$0.00	\$0.40	\$1.54	\$1.94
3.3.2	Chart Agent Model	\$0.00	\$0.86	\$0.86	\$0.86	\$0.86	\$3.44
3.3.3.1	Catalog Elimination	\$0.00	\$0.10	\$0.10	\$0.10	\$0.10	\$0.40
3.3.3.2	Facility Space	\$0.00	\$0.60	\$0.60	\$0.60	\$0.60	\$2.40
3.3.3.3	Facility Services	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.95
Total Savings		\$2.78	\$6.96	\$8.90	\$11.69	\$15.18	\$45.51
3.3.1	Increased Revenue/Pricing Model	\$8.9	\$8.9	\$8.9	\$8.9	\$8.9	\$44.50
Total Benefit		\$11.68	\$15.86	\$17.80	\$20.59	\$24.08	\$90.01

Table 4.2: Summary of Total HPO FTE Savings

		Projected Annual and Cumulative Benefit from HPO (In FTEs)					
Section	Description	Year 1 (FY 2009)	Year 2 (FY 2010)	Year 3 (FY 2011)	Year 4 (FY 2012)	Year 5 (FY 2013)	Total 5 year (\$)
3.1.2	Reproduction	19	10	2	2	0	33
3.1.3	Distribution	4	3	4	1	2	14
3.2.3	NACO/NFPO Integration	0	0	0	3	7	10
Total Benefit		23	15	6	6	9	57

4.1.2 Implementation Costs Summary

Nearly all of the implementation costs are associated with the AVN Integration described in Section 3.1.1. To ensure the cost savings are realized by FY13, the envisioned organization must be implemented prior to the end of FY12. Therefore, the estimated implementation cost of \$17M must be funded by FY11. The Reproduction implementation cost of \$0.30M for an additional CTP machine should be funded by FY10 for the full benefit. Table 4.3 summarizes the projected HPO implementation costs.

Table 4.3: Summary of Projected HPO Implementation Costs

Initiative	Hardware/ Equipment	Software Procurement	Software Development/ Conversion	Labor / Contract	Training	Total
AVN Integration	\$0.82 M	\$0.63 M	\$9.24 M	\$5.77 M	0.54 M	\$17.0
Reproduction	0.30 M	\$0	\$0	\$0	\$0	\$0.30
Total	\$1.12 M	\$0.63 M	\$9.24 M	\$5.77 M	\$0.54 M	\$17.3 M

4.1.3 Additional Workload Cost Summary

As mentioned in Section 3.1.4, NACO/AVN will realize new and increased work requirements in addition to the baseline requirements during the HPO time frame. These new requirements represent an equivalent of approximately 47 FTE’s costing around \$5.7M annually. Due to the NACO HPO changes, it is expected that the additional 84,020 annual labor hours will be met using the significant amount of resource savings through the efficiency gains described in Section 3. Approximately \$1M will be funded separately for the additional RVM and ERAM workload and the remaining \$4.6M cost avoidance will be achieved with the HPO implementation. Table 4.4 summarizes the additional work requirements and associated costs.

Table 4.4: Additional Workload Requirements Summary

Section	FY13 and Beyond Requirements	Annual Labor Hours	Annual Cost of New Workload
3.1.4.1	Enroute Automation Modernization (ERAM)	1,040	\$70,720
3.1.4.2	Common Airport Mapping Initiative (CAMI)	3,520	\$239,360
3.1.4.3	Obstacle Repository System (ORS)	29,894	\$2,032,792
3.1.4.4	New Aeronautical Chart Products	922	\$62,719
3.1.4.5	Radar Video Maps (RVM)	14,256	\$969,408
3.1.4.6	Increase in New & Amended IFP and Non-Procedures Revisions	34,388	\$2,338,394
Total		84,020	\$5,713,393

4.2 Performance Tracking and Control

4.2.1 Performance Management Plan (PMP)

A PMP will be created to evaluate the HPO’s performance in each of the initiatives described in the Envisioned Organization. The PMP will include, but may not be limited to, a performance management team structure, surveillance/performance evaluation methods and plans, documentation requirements, corrective action plans, reporting requirements, and a work change notification plan. In addition, ISO quality objectives and metrics will be established in the AVN Quality Management System (QMS) to measure improvements in the quality of products and

services. The PMP and ISO QMS will ensure that the HPO implementation and performance goals are met.

4.2.2 HPO Cost and Savings Tracking Report

The HPO Team created an HPO Cost and Savings Tracking Sheet to capture and monitor actual cost and savings against the baseline over the five-year performance period. There are four sections to the tracking report:

- **Actual Costs** – The report allows NACO to track costs and savings by labor and non-labor categories, such as equipment costs, material and supply costs, travel costs, and other costs. This is a higher level report that provides an overview of costs and savings at the agency level.
- **COMPARE Costs** – The baseline and HPO labor and non-labor costs were entered into COMPARE. The tracking sheet covers four sections grouped by COMPARE: Personnel Costs, Material and Supply Costs, Other Specifically Attributable Costs, and Overhead Costs.
- **Initiative Tracking** – Each initiative has its own report which includes a *Before and After Tracking* table with key metrics, costs and revenue, and a *Financials Tracking* table that shows revenue impact, cost savings, and return on investment. Initiatives include the pricing model, Reproduction and Distribution staffing analysis, chart agent model and the AVN Integrated initiatives.
- **Actual Savings Summary** – This sheet summarizes the costs savings and impact on revenue for each initiative across the five year HPO performance period.

4.3 HPO Implementation

4.3.1 Implementation Plan

The overarching objective of the HPO implementation will be to transform NACO from its current state to the envisioned organization efficiently and without any negative impact on NACO's sustained performance of core activities. The HPO Team was mindful of the feasibility of implementation in developing recommendations for the NACO HPO. The HPO Team and NACO's leadership will jointly develop an implementation plan that identifies clear and achievable goals, specifies a realistic timetable for the change initiatives, and delineates clear roles and responsibilities for NACO/AVN staff. As a long-term initiative, NACO staff will begin to monitor organizational performance more closely through the use of performance metrics. As part of the HPO effort, the tools created to enable NACO staff to track progress toward the envisioned organization will be explicitly linked to implementation milestones. Full implementation of the envisioned organization is expected to be complete by the fifth year of the HPO period (FY13).

Managing the workforce transformation required to implement the HPO is a critical element of the effort. Since the beginning of the process, avoiding a costly and disruptive reduction in force has been a principal concern of the FAA leadership. The HPO Team recognized early on that the high number of NACO employees that would become eligible for retirement during the HPO period represented both a threat and an opportunity for the organization. By communicating the organization's plan effectively to their employees, the HPO Team anticipates that the NACO leadership will be able to achieve the necessary workforce reduction through attrition. To reach

the Reproduction Team's optimal staffing levels within the projected time frame, the HPO Team recommends that NACO pursue buy-out authority.

4.3.2 Training Program

An enhanced training program is critical to ensure a successful transition to the Envisioned Organization. Formal training will be needed to transition the workforce from their current skill sets into an Aeronautical Information Specialist role in support of the HPO plan. The HPO Team recommends that NACO establish a formalized training program, which should include a training team carved from the current resources (FTEs) and also convert the current server room (space) in Silver Spring Metro Center (SSMC). This space should be converted into a training room/collaborative meeting space.

4.4 Continuous Improvement Management Plan

In addition to the measures described in detail in this document, the HPO Team recommends that NACO undertake several initiatives to meet future challenges and sustain organizational improvement during and beyond the HPO period. An HPO Continuous Improvement Management Plan (CIMP) will be created to ensure continuous progress, forward planning, and further efficiencies throughout the HPO time frame. The CIMP will include a review committee structure to evaluate, approve, and track improvements as part of the HPO. As an example, the HPO Team makes the following continuous improvement recommendations to be undertaken during the HPO performance period:

- Pursue to shift the USPS budget authority and funding currently allocated to FAA Printing, Distribution and Mail Program, APF-001 over to NACO to provide flexibility in procuring the best value for small parcel shipping. Currently the small parcel shipping options for NACO's distribution program are FAA mandated options of U.S. Postal Service (USPS) and Federal Express (FedEx). Current annual shipping costs are approximately \$2M, and substantial savings (estimated at 10% of current expenses) could be realized by allowing NACO to obtain alternative shipping services to include other sources such as the United Parcel Service (UPS) to provide for competitive pricing.
- Convene a working group to study and develop a strategy to address the expected long-term decline in demand for paper products and growth in demand for digital products. As electronic navigational equipment becomes more widely available and accepted, NACO faces a shift in demand that will entail fundamental changes to its business model. The HPO Team recommends that a working group be created to forecast the long-term trends in demand for NACO's products, establish a pricing methodology for NACO's digital products, and identify strategies for efficiently and effectively meeting the aviation community's need for reliable aeronautical information in the future environment.
- Implement robust data collection and analysis processes to more accurately forecast demand in the short and mid term. Improved forecasting processes could reduce waste from overproduction, prevent costly re-prints, and help managers anticipate fluctuations in revenue and costs.
- Implement an electronic data interchange (EDI) system to standardize and streamline commercial interactions with chart agents. Once established, an EDI system could

Appendix – NACO HPO

significantly reduce NACO's need for clerical and administrative support for the distribution unit and ensure the integrity of NACO's accounting records.

- Implement best practices in procurement. NACO currently relies on contractor assistance at the data transfer, production, and distribution stages. NACO should re-evaluate its current contract arrangements to ensure that they offer the best available combination of price and service. Specifically, all future and existing printing support contracts need to be evaluated for nationwide competition and elimination of unnecessary requirements. This will prevent high cost sole-sourced printing contract awards. NACO will realize the best value from future procurement by specifying contract requirements clearly and targeting them to NACO's needs and by facilitating competitive, nationwide solicitations.

< This page intentionally left blank >

SECTION 5: MILESTONES

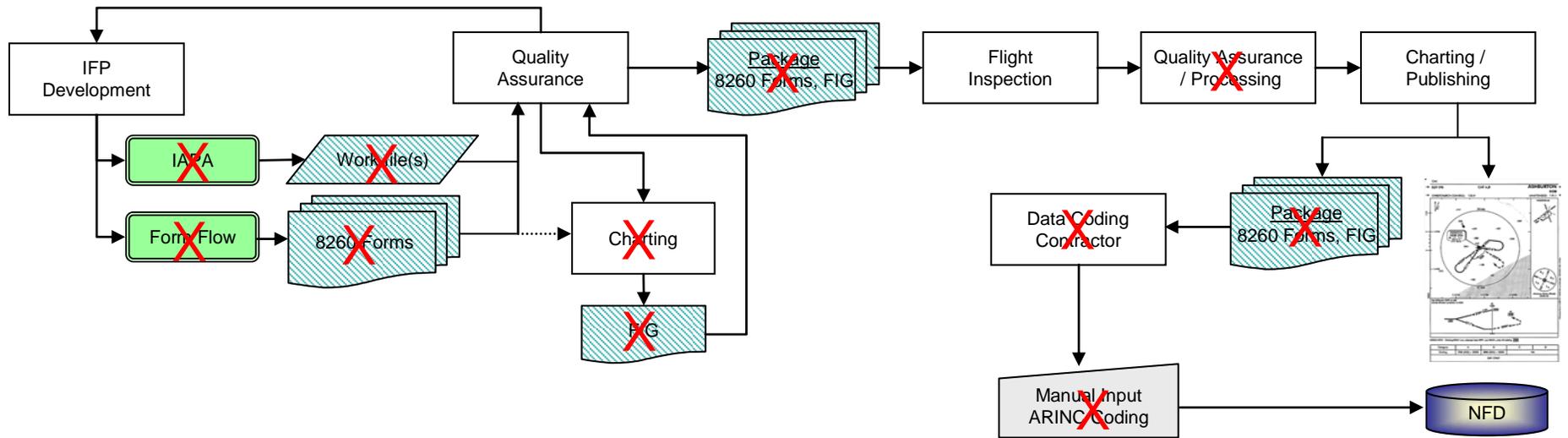
Table 5.1 lists key HPO milestones along with scheduled completion and current status.

Table 5.1: Key HPO Milestones

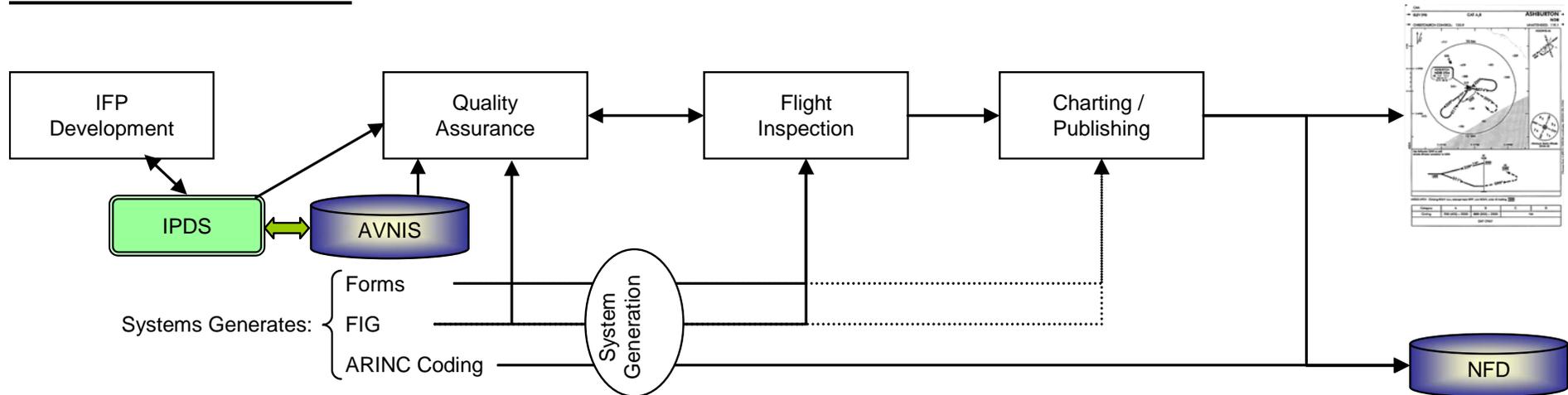
Milestone	Schedule Completion	Status
Establishment of BPR/HPO Team		Completed
Calculation of baseline costs reflecting full costs of government performance	February 2008	Completed
Development of improved work activities/processes and business model	May 2008	Completed
Final HPO White Paper & Briefing for OMB	September 2008	Early (June) Completion
Implementation of BPR/HPO	September 2008	On-schedule
Performance tracking	FY 2009 and later	On-schedule

Attachment 1 – AVN Gold Standard NFD Process

Current Process Flow

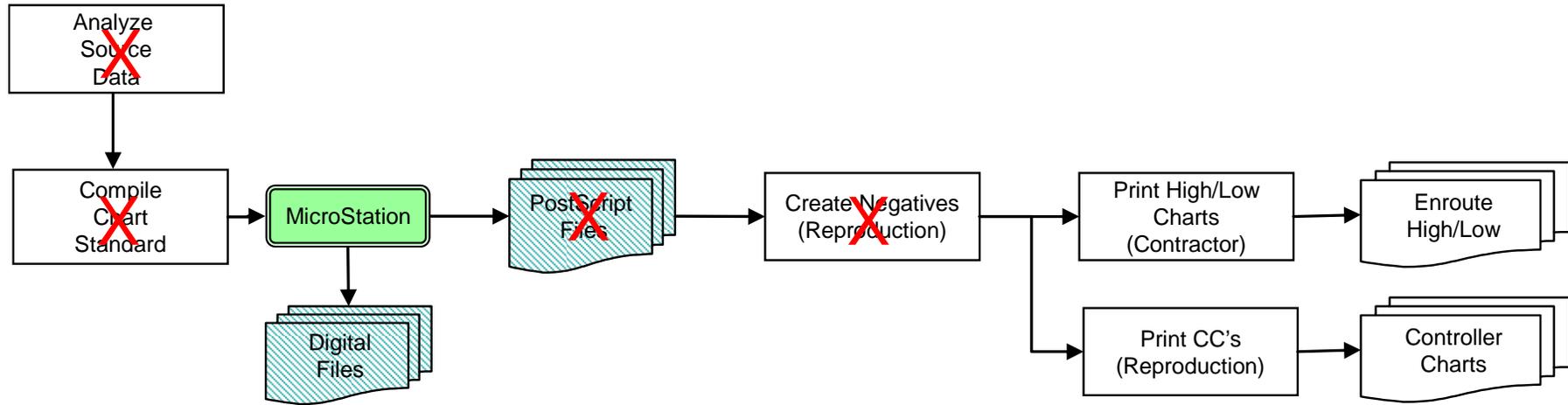


Envisioned HPO Process Flow

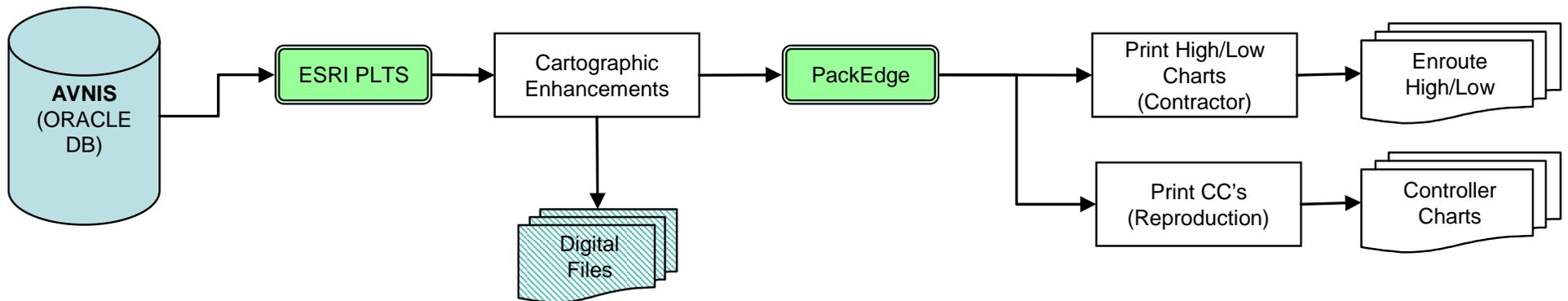


Attachment 2 – Enroute Chart Automation

Current Process Flow

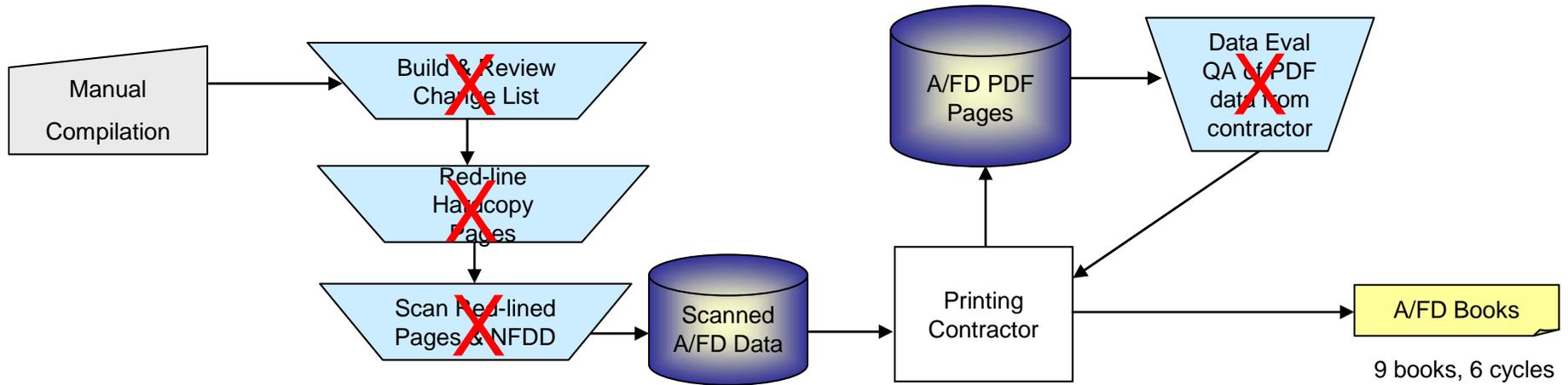


Envisioned HPO Process Flow

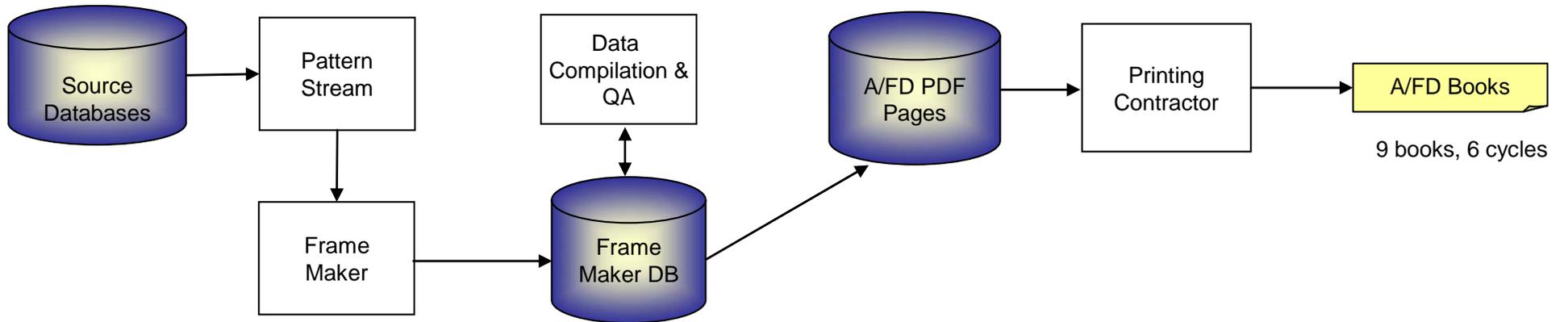


Attachment 3 – Airport/Facility Directory Automation

Current Process Flow

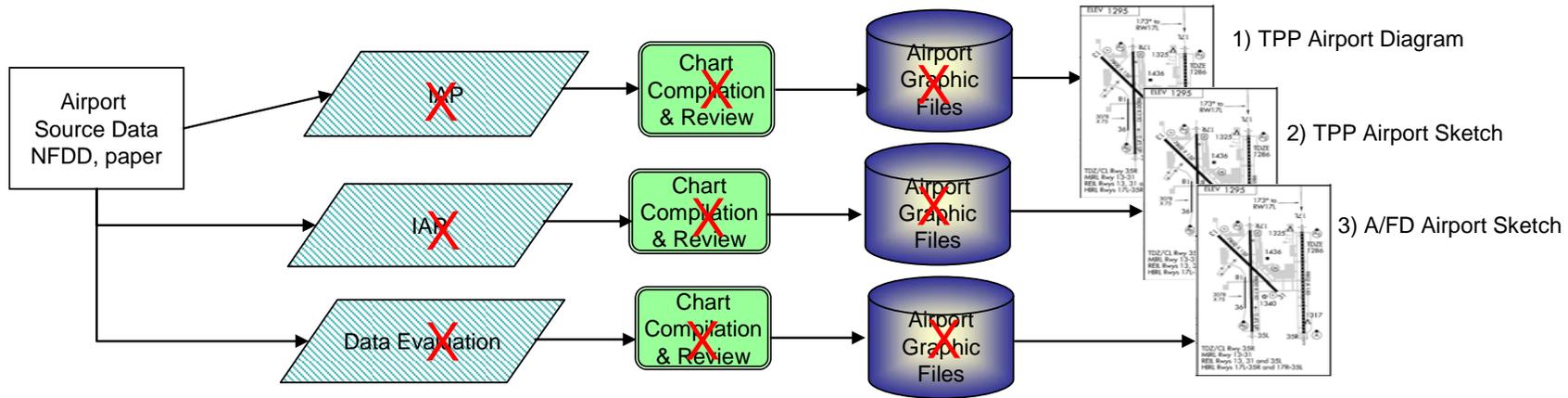


Envisioned HPO Process Flow

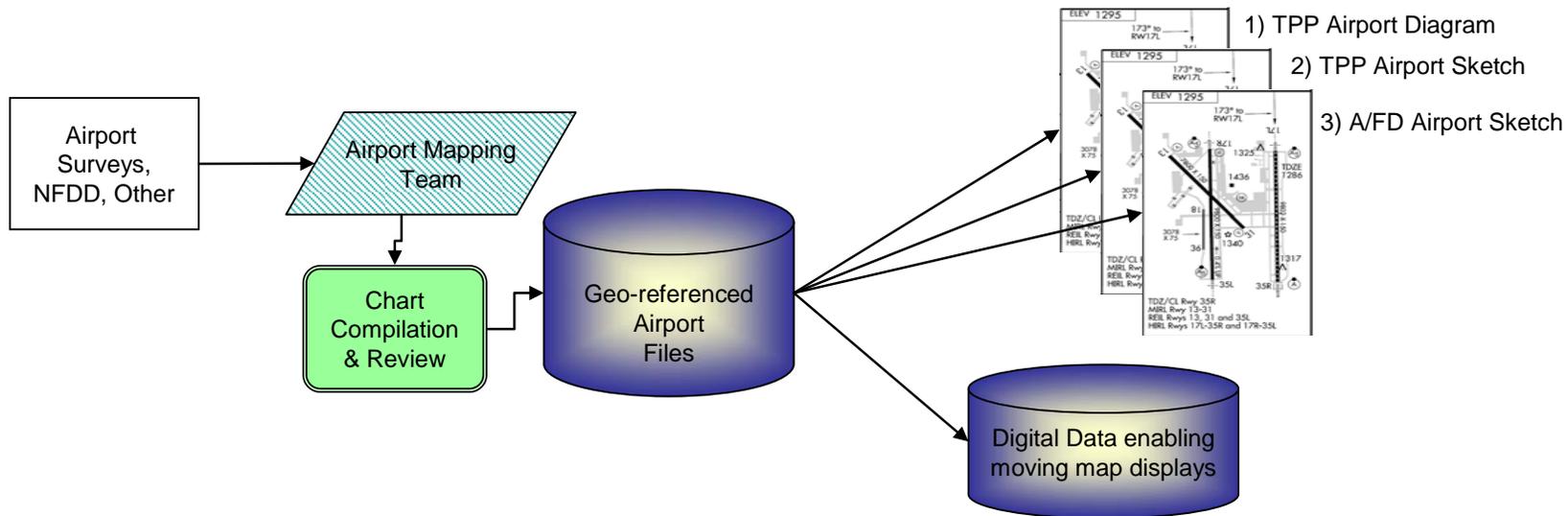


Attachment 4 – Common Airport Mapping Initiative (CAMI)

Current Process Flow

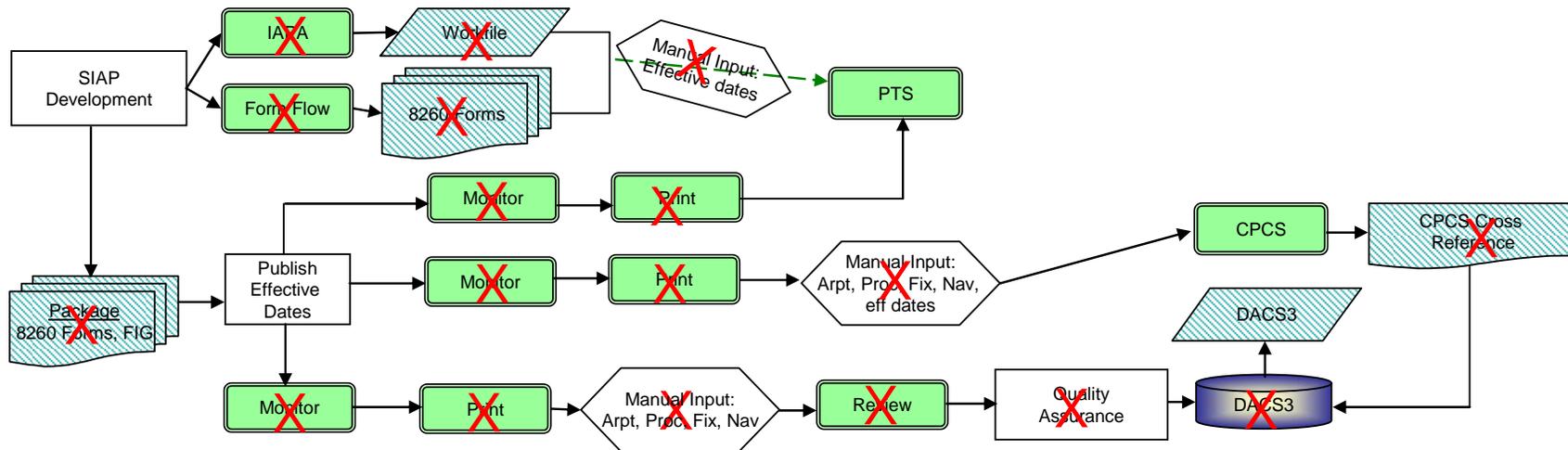


Envisioned HPO Process Flow

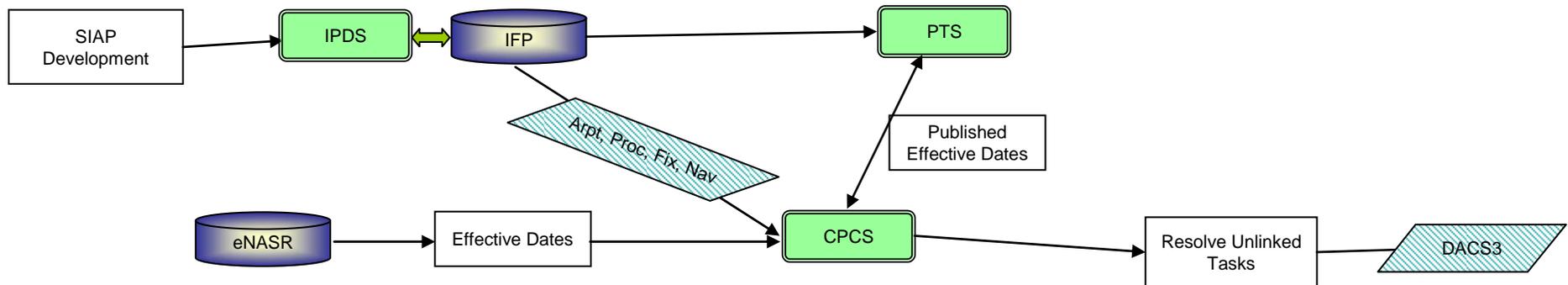


Attachment 5 – Integrated AVN Production Tracking Systems

Current Process Flow

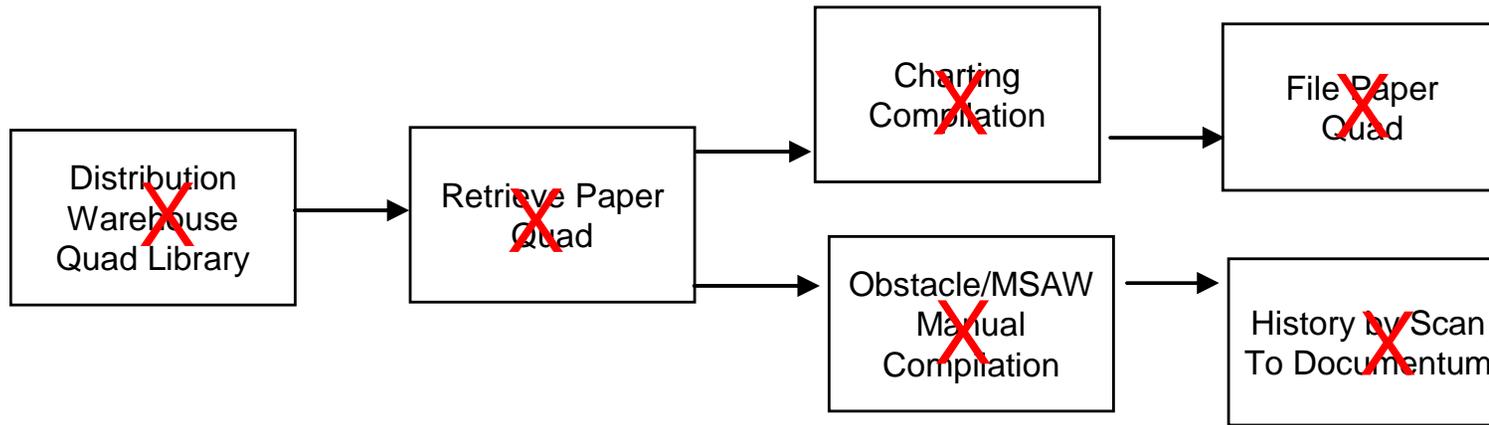


Envisioned HPO Process Flow

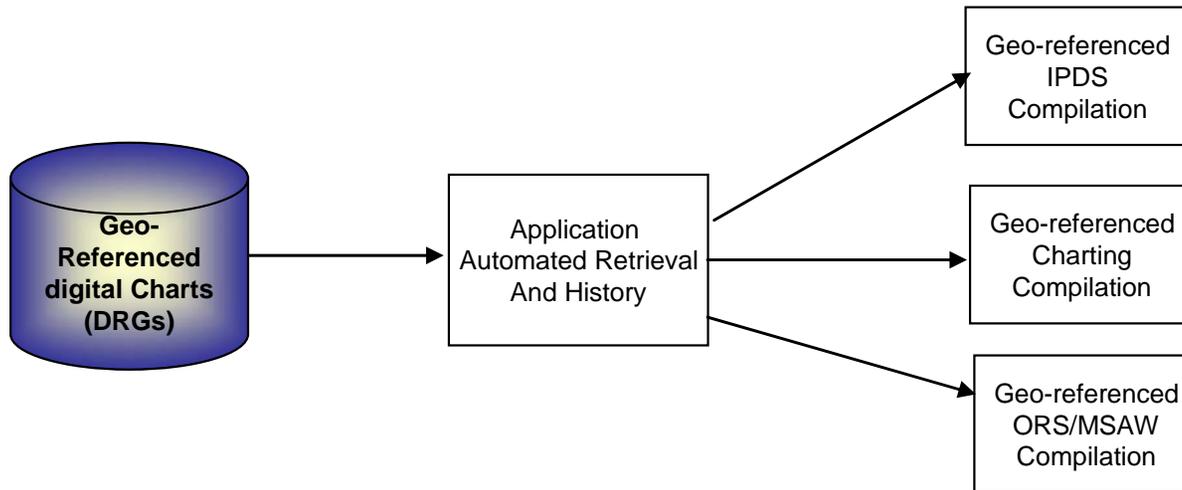


Attachment 6 – Digital Topographic Maps across AVN

Current Process Flow

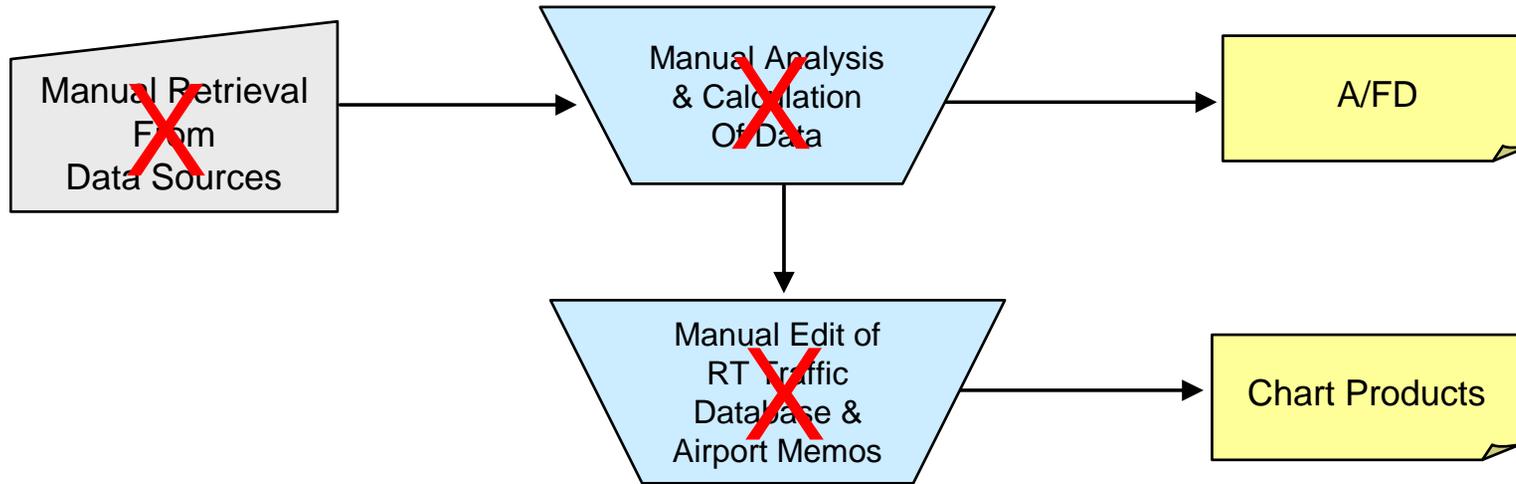


Envisioned HPO Process Flow

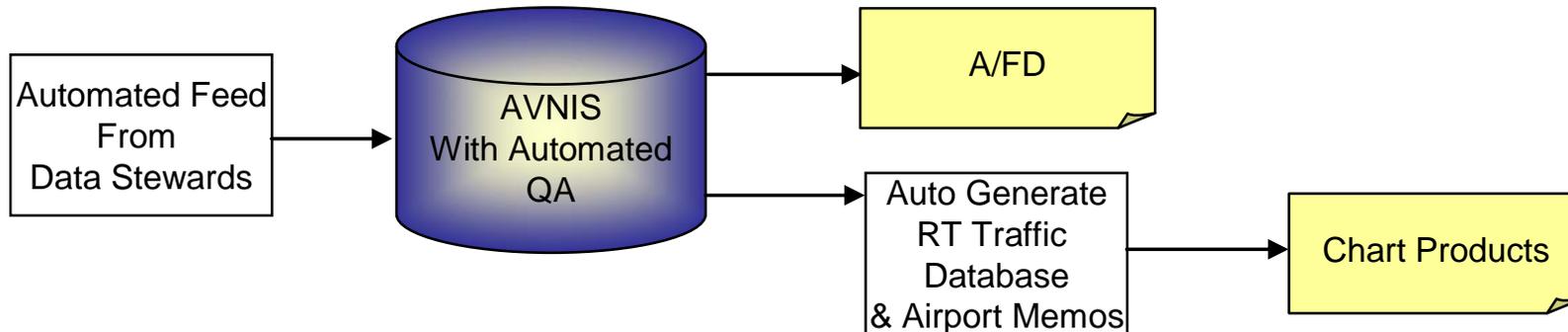


Attachment 7 – AVN Database Integration: Airport Data

Current Process Flow

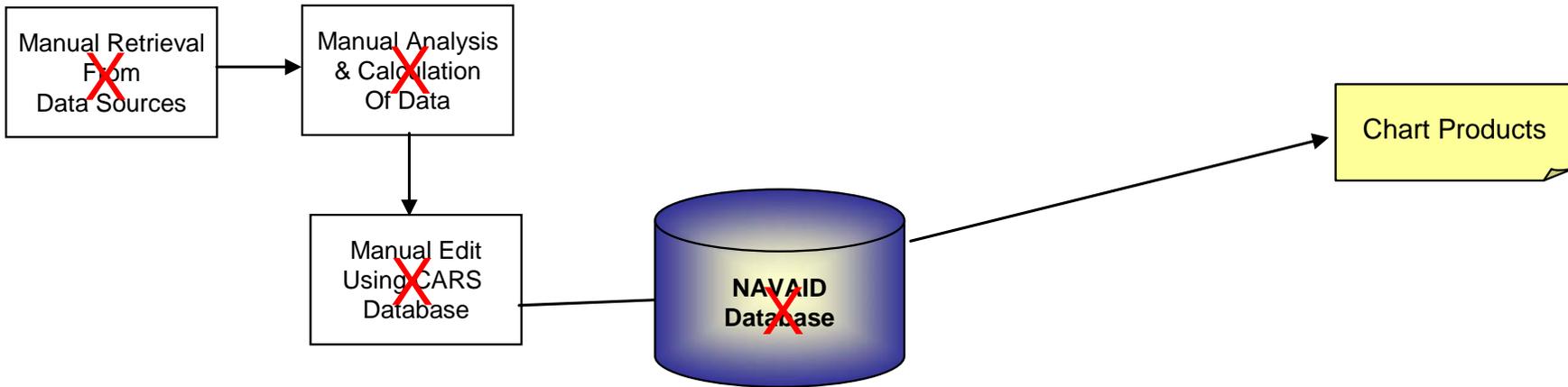


Envisioned HPO Process Flow

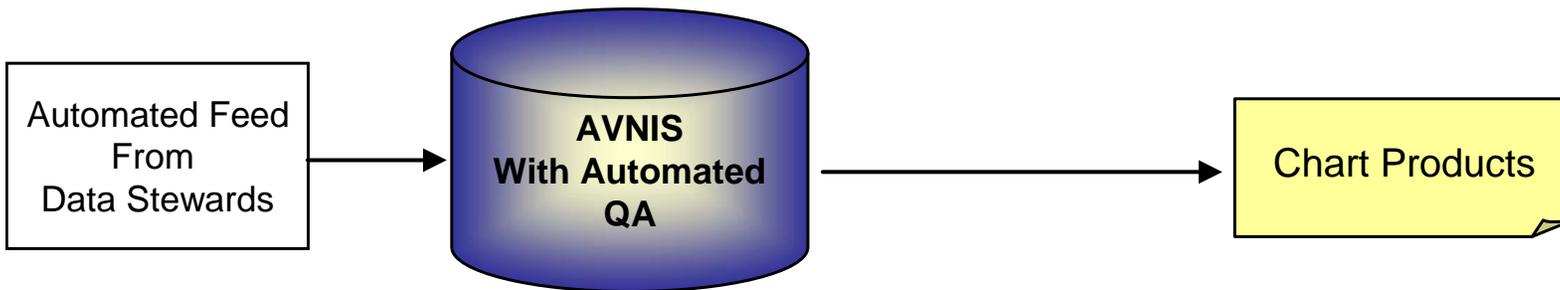


Attachment 8 – AVN Database Integration: NAVAID Data

Current Process Flow

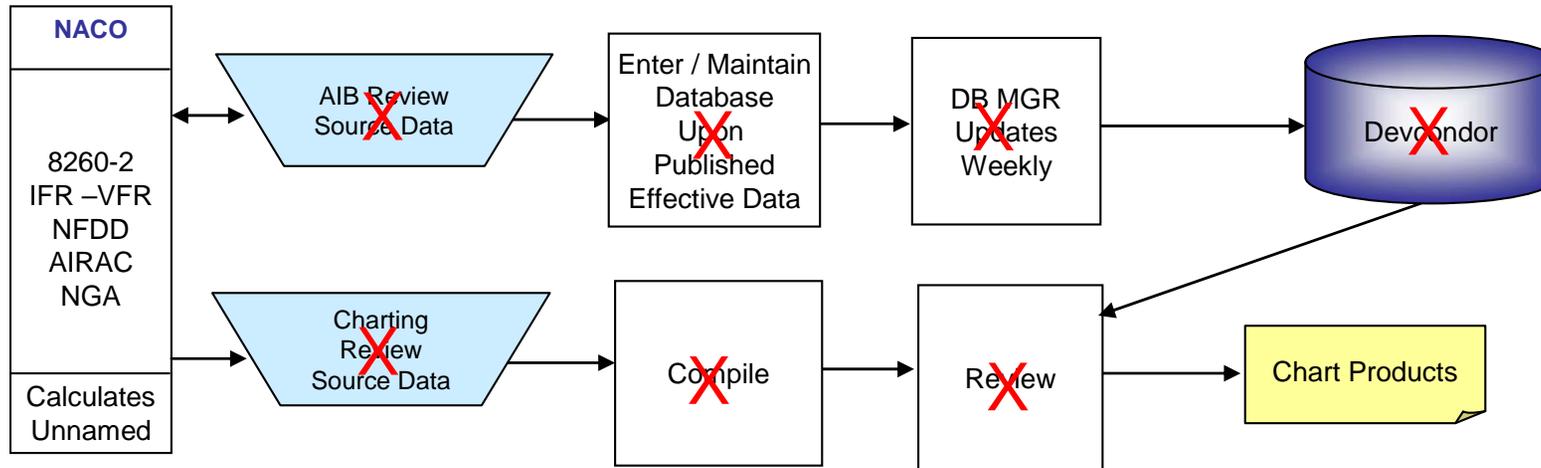


Envisioned HPO Process Flow

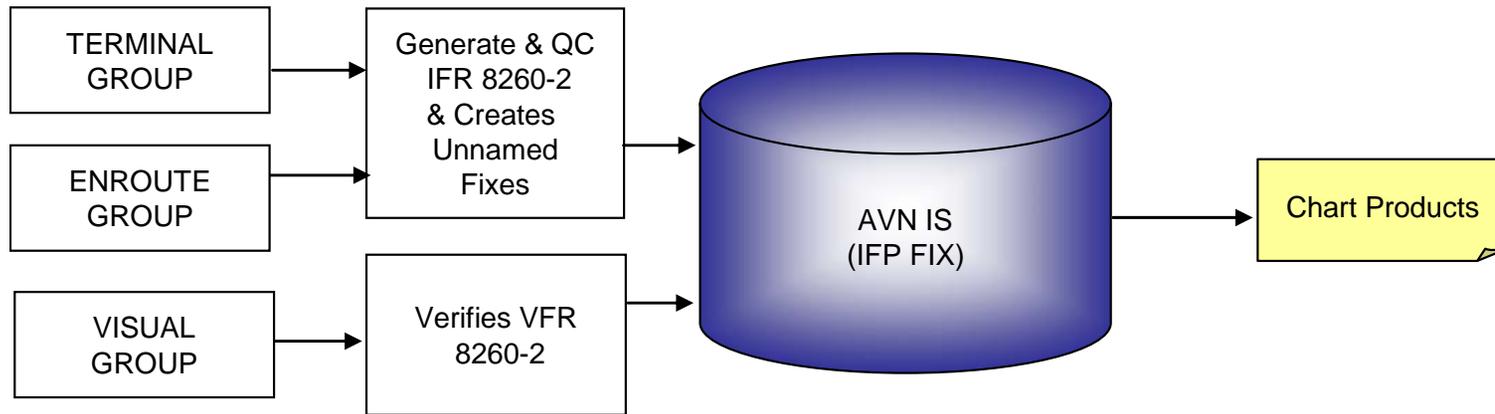


Attachment 9 – AVN Database Integration: Fix/Waypoint Data

Current Process Flow

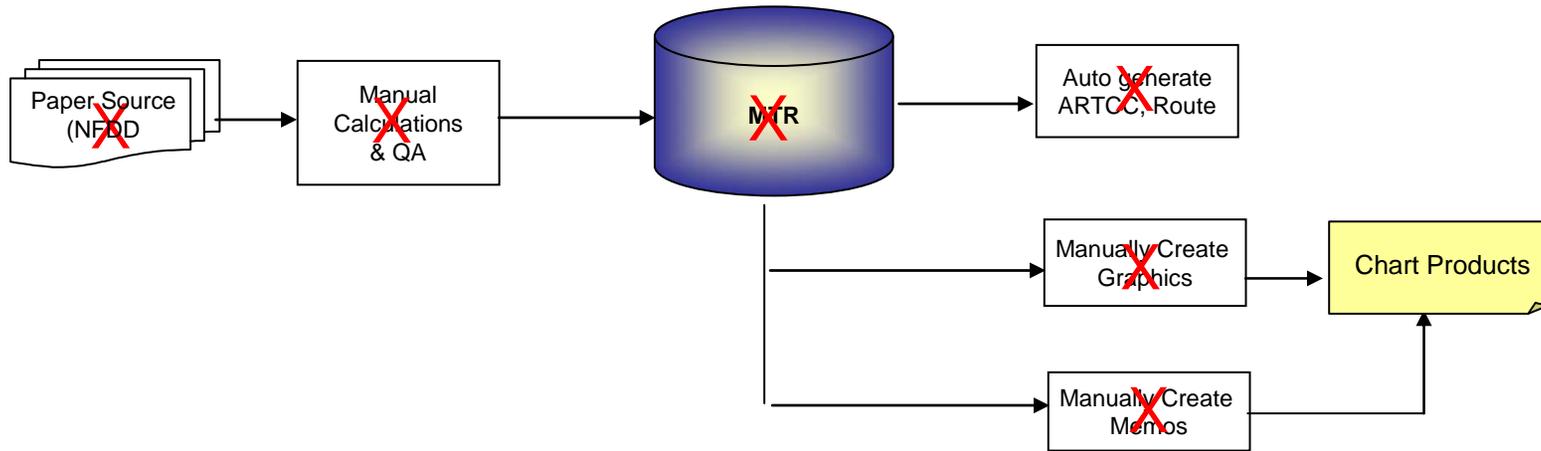


Envisioned HPO Process Flow

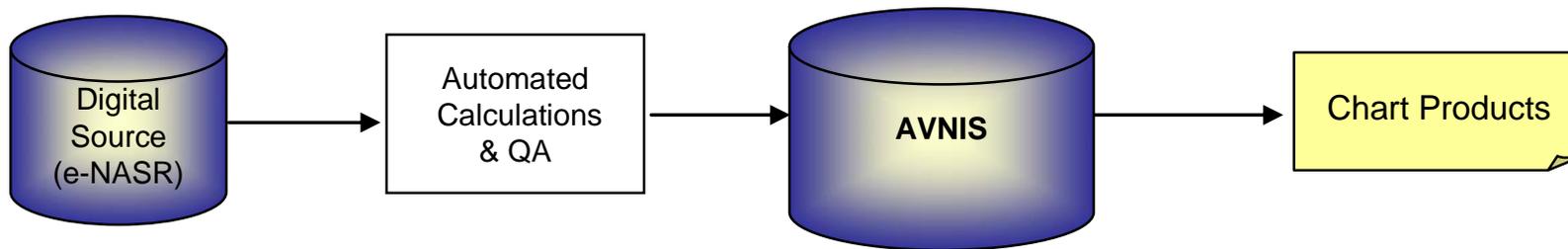


Attachment 10 – AVN Database Integration: Military Training Route (MTR) Data

Current Process Flow

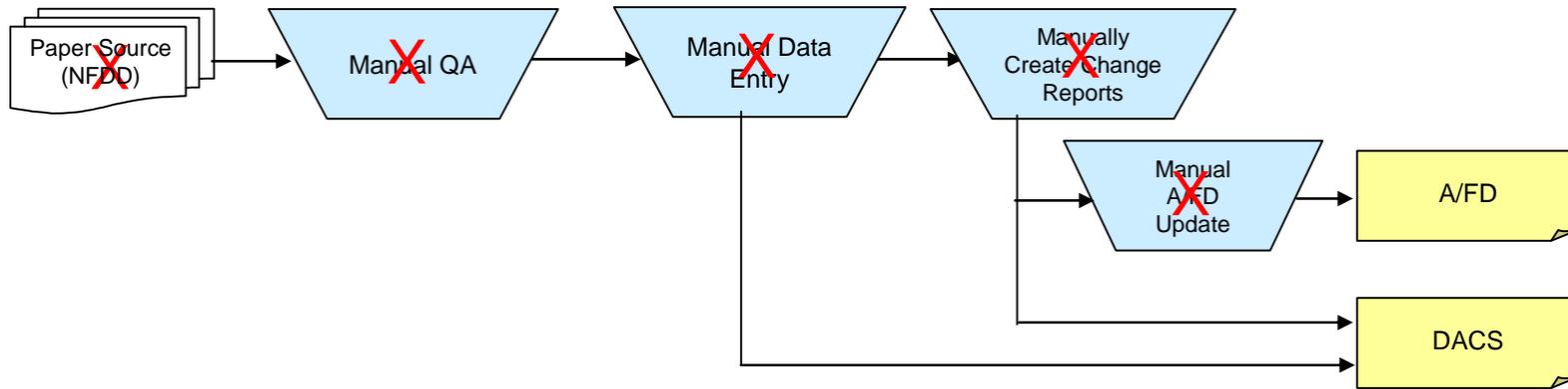


Envisioned HPO Process Flow

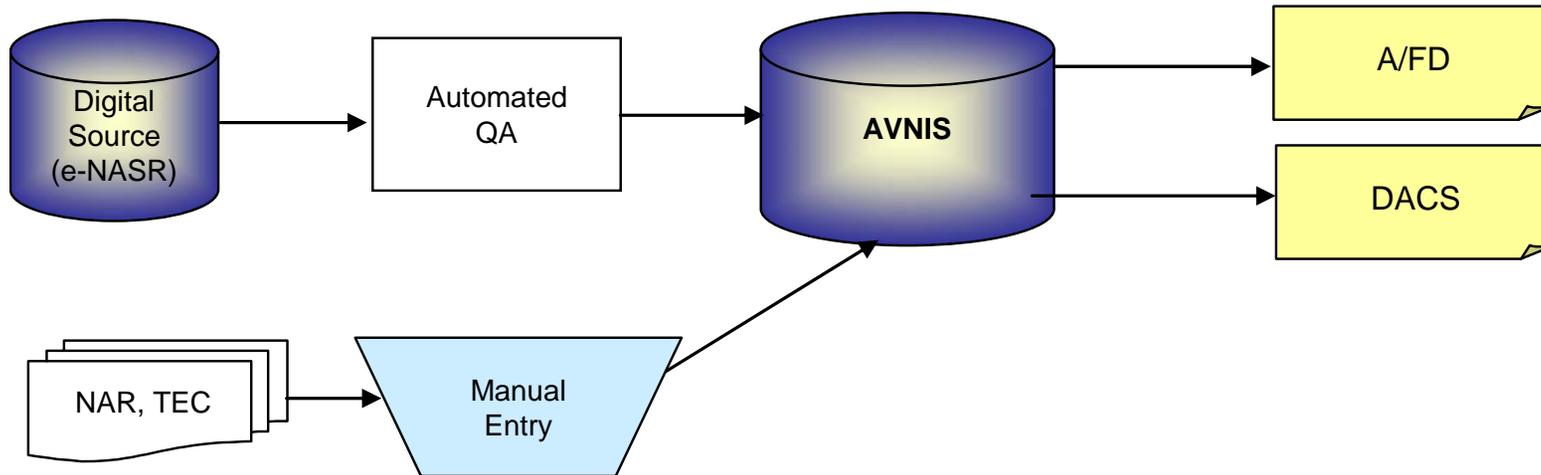


Attachment 11 – AVN Database Integration: Preferred, TEC, and NAR Routes Data

Current Process Flow

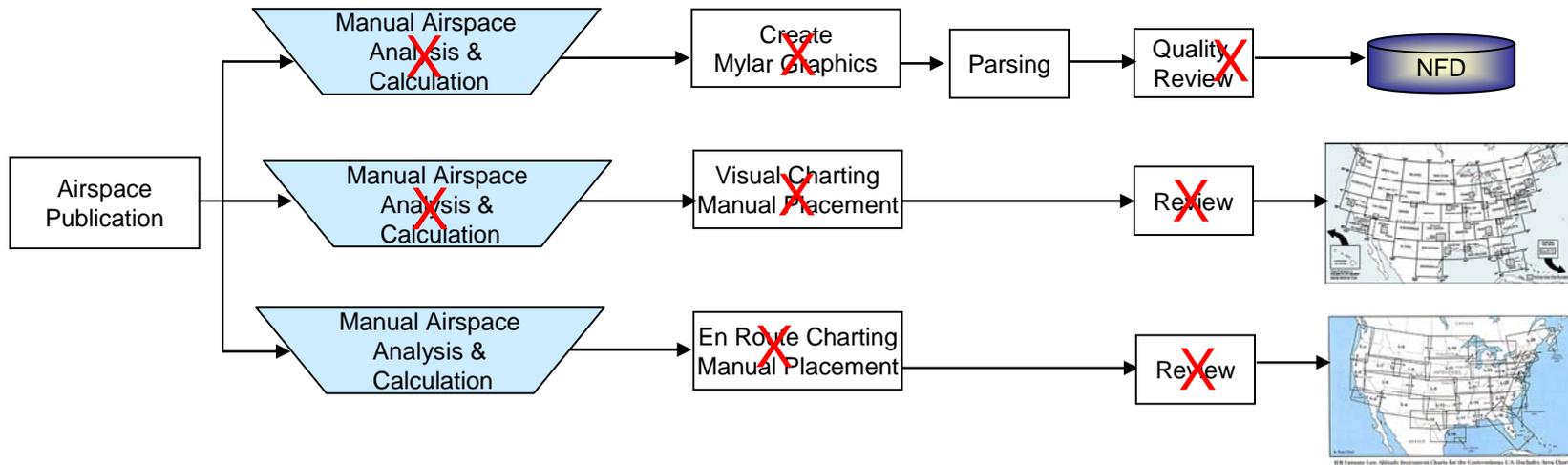


Envisioned HPO Process Flow

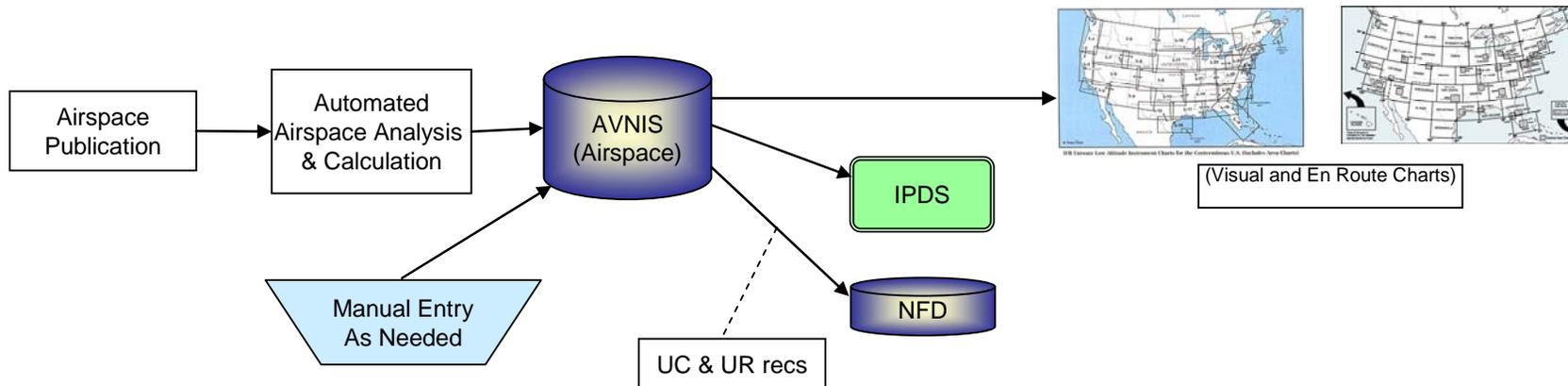


Attachment 12 – AVN Database Integration: Airspace Data

Current Process Flow

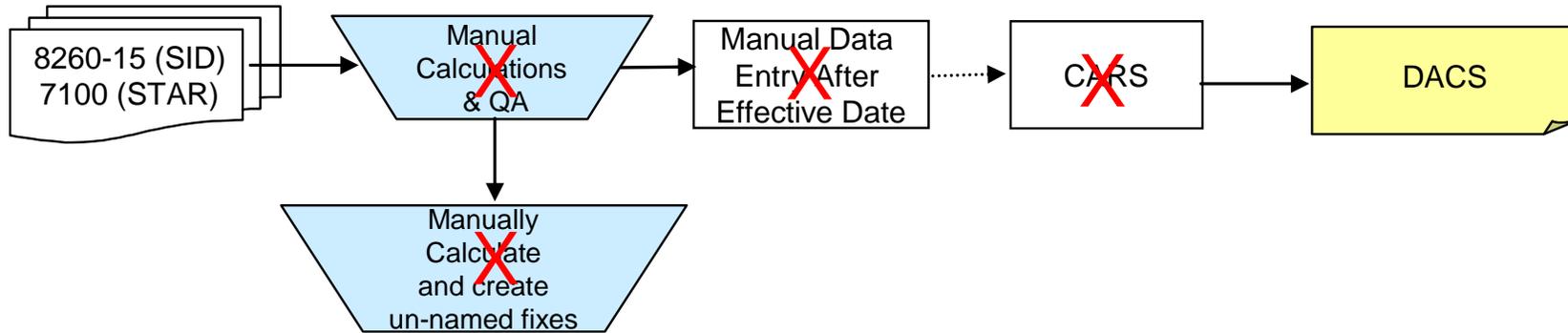


Envisioned Process Flow

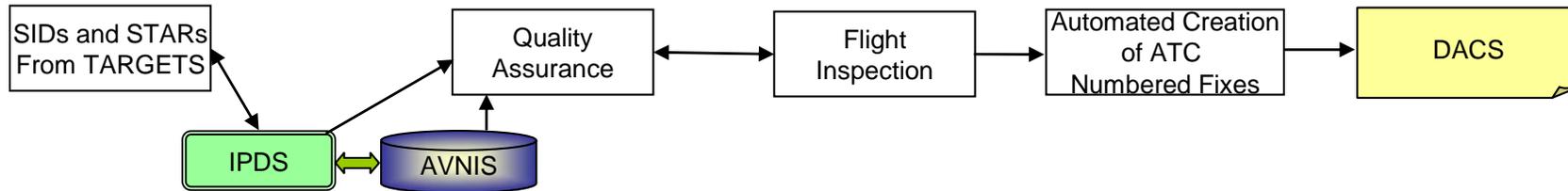


Attachment 13 – AVN Database Integration: SID/STAR Data

Current Process Flow

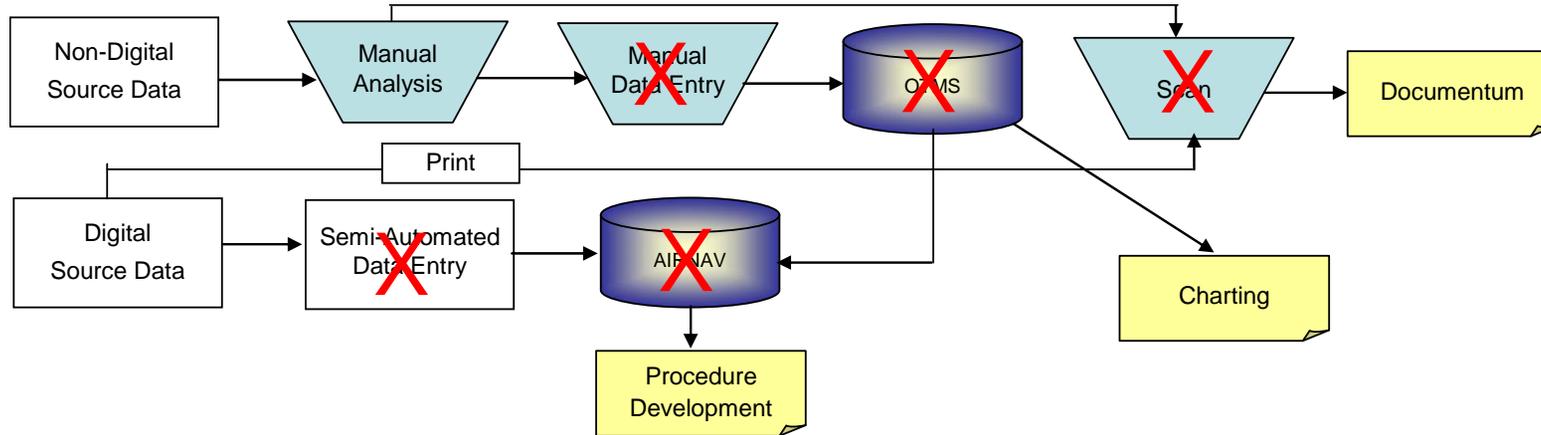


Envisioned HPO Process Flow

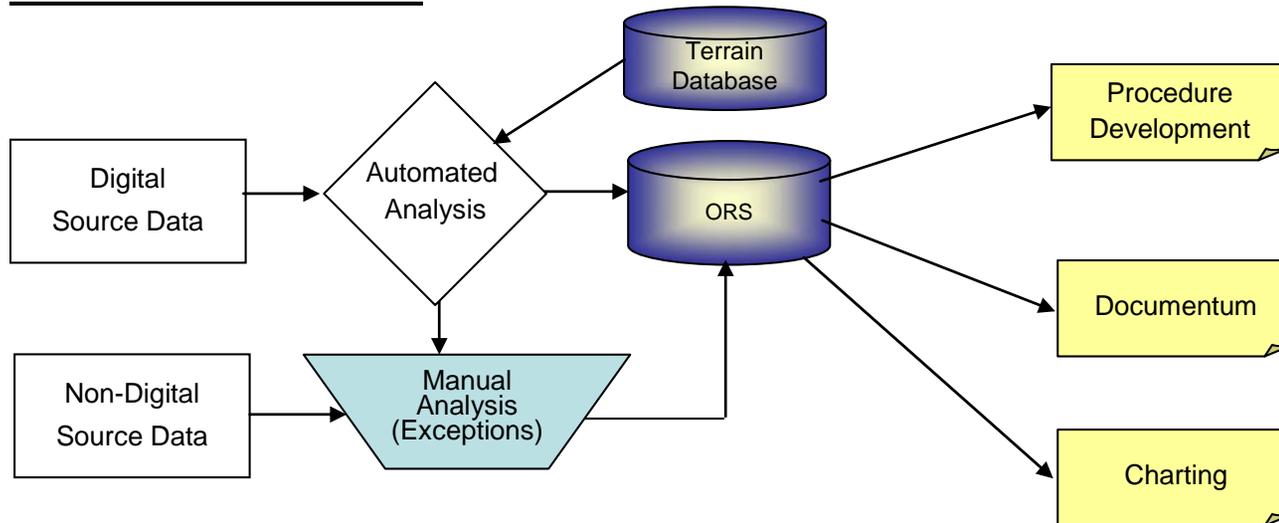


Attachment 14 – AVN Database Integration: Obstacle Data

Current Process Flow

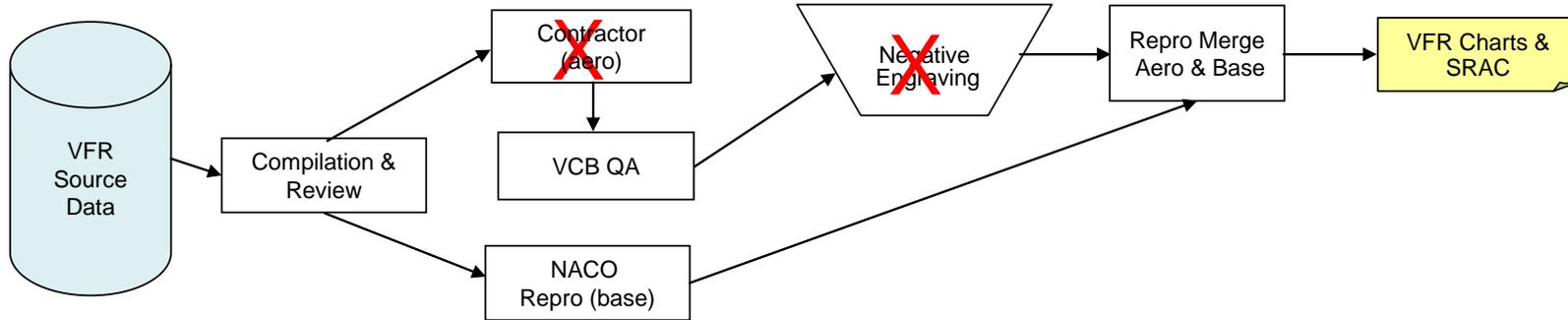


Envisioned HPO Process Flow

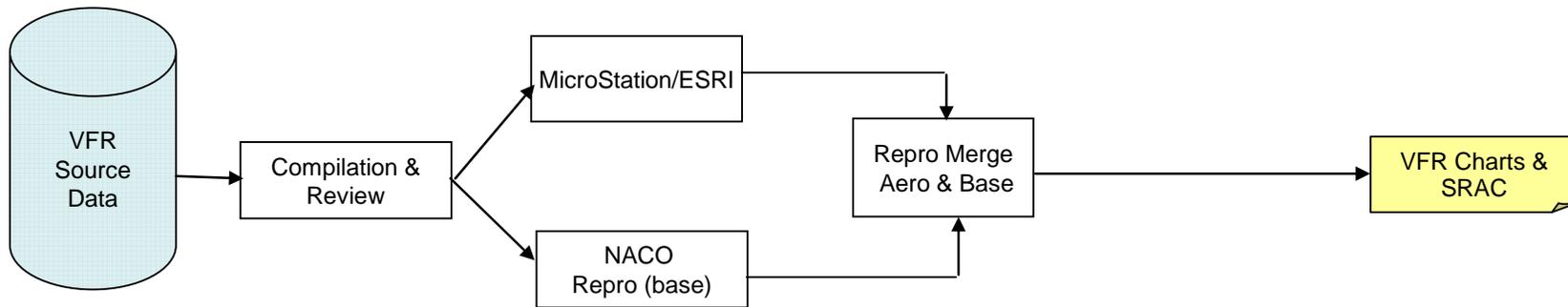


Attachment 15 – VFR Digital to Plate

Current Process Flow

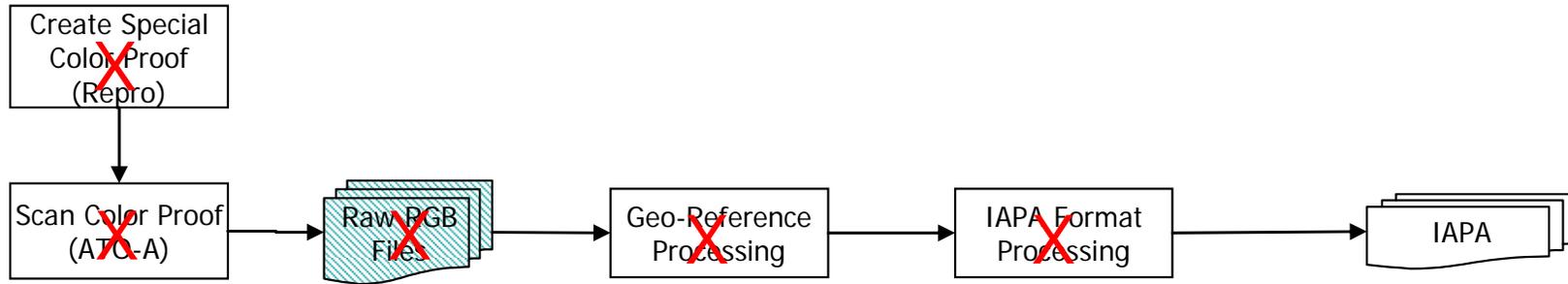


Envisioned HPO Process Flow

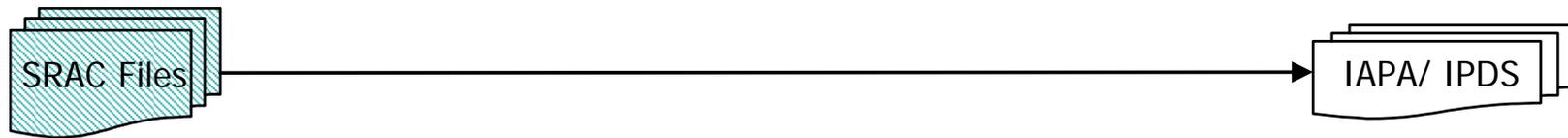


Attachment 16 – Standardized Use of SRAC AVN-Wide

Current Process Flow



Envisioned HPO Process Flow



Attachment 17 – Press Specifications Summary from Benchmark Study

Press Owner/Operator	National Aeronautical Charting Office			Bureau of Engraving and Printing	Williams & Heintz Map Corp.		Jeppesen Sanderson, Inc.		
	Press 1	Press 4	Press 5		Press 1	Press 2	Press 1	Press 2	Press 3
Make of Press	Harris Seybold	Harris Seybold	Harris Seybold	Heidelberg	Roland	Roland	Heidelberg	Heidelberg	Heidelberg
Model	LVB	L60A	L560 B	Speedmaster	804	806	QM41	SM74	SM102
Type	sheet-fed	sheet-fed	sheet-fed	sheet-fed	sheet-fed	sheet-fed			
Year Purchased	1959	1972	1973	1989	1985	1995	2001	2002	2000
Recent Upgrades or Overhauls	none	<ul style="list-style-type: none"> • 2006 central chill system • 2008 GE drive board replaced 	<ul style="list-style-type: none"> • 2006 central chill system • 2007 delivery chains/idle sprocket (overhaul) • 2007 5th unit inker - new bushings, shaft, bearings, oil lines 	<ul style="list-style-type: none"> • UV drying units 			none	none	none
Speed (IPH)	4,000	6,000	6,000	10,500 - 11,000	6,000	6,000	8,000	10,000	10,000
Number of Ink Towers (Colors)	2	5	5	6 colors with a perfecting unit	4	6	2	5	2
Width of Print	43" x 60"	44" x 60"	44" x 60"	28" x 40"	64"	64"	18"	28"	40"
Level of Automation	none	<ul style="list-style-type: none"> • auto blanket washer 	<ul style="list-style-type: none"> • auto blanket washers 	<ul style="list-style-type: none"> • console - ink keys and registration • automated ink keys • continuous dampening system 	<ul style="list-style-type: none"> • remote ink control 	<ul style="list-style-type: none"> • remote ink control 	none	none	none
Other Features	none	none	none	<ul style="list-style-type: none"> • split fountain ink • invisible ink • micro printing • perforating in - line 					
Press operator(s)	2	5	5	2 with sporadic floor help	2 - 3	2 - 3	1	1 - 2	1 - 2

Attachment 18 – Detailed HPO Staffing Plan for Reproduction

[See Excel File]

Attachment 19 – Detailed HPO Staffing Plan for Distribution

[See Excel File]

Attachment 20 – NACO Phase One Organizational Chart at the AVN Level

[See Excel File]

Attachment 21 – NACO/NFPO Integration Phase Two Organizational Chart

[See Excel File]