Case Study for the National Aeronautics and

The move from paper intensive, multi-source cost management system to integrated, paperless solution (Core Financial)

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Images courtesy of NASA.

Within the past five years, the National Aeronautics and Space Administration (NASA) Langley Research Center has made a concerted push toward integrating its procurement and financial management systems through the agency's Integrated Financial Management Program (IFMP) initiative. The primary focus of this effort has been the implementation of key software modules, including Core Financial.

This study provides a clear example of how NASA is already reaping benefits from its implementation of Core Financial through improved cost management of vendor contracts. NASA Langley has moved from a legacy environment of multiple systems and supporting spreadsheets, to an integrated solution on one system made possible by the Core Financial environment.

Space Administration (NASA)

The NASA Environment at Langley Leading up to the Core Financial Implementation

To supplement its financial management staff, NASA Langley—located in Hampton, VA—engaged contractor support from IBM Business Consulting Services to take over many of the daily duties of financial management staff who originally had been diverted to work exclusively on the IFMP initiative.

The contractor team assimilated itself into the financial management structure, working one-on-one with NASA team members. NASA Langley successfully integrated the contractor team members into the organizational hierarchy, and includes them in day-to-day operations and key decisions. The team provides accounting and financial analysis for Langley's monitored contracts, which make up the large majority of the center's contractor budget.

NASA's strategy of supplanting federal staff with contractors provided several advantages to the agency during this challenging time. First, the federal staff was freed from day-to-day duties to focus exclusively on preparing for the new system implementation, and learning about the system's capabilities. NASA was also able to document desk procedures with contractor support, thereby ensuring that baseline accounting services were well understood at transition and that key activities were not overlooked. The flexibility afforded by the contract enabled NASA to increase the level of effort during the most critical phases of the transition, and then quickly reduce the level of effort as the new system came online.

NASA Langley, Meeting the Mission of the Integrated Financial Management Program

The mission of the IFMP program is to:

Improve the financial, physical and human resources management processes throughout NASA. IFMP is reengineering NASA's business infrastructure and implementing enabling technology to provide better management information for decision-making.[1]

One of IFMP's key objectives is "consistent and real-time financial management information." This is where the Core Financial module comes in.

On June 23, 2003, NASA Langley "went live" on Core Financial (one of the last centers to do so, as part of the third wave of center implementations). This followed an accounting blackout period of nearly six weeks, and a 15-day marathon by its cost management team to map hundreds of Langley's contracts to the Core Financial classification structure and enter cost data from its legacy financial management system into Core Financial. After several months of operating under Core Financial, Langley's Financial Management office is starting, albeit slowly, to reap the benefits of working with one system. This has been especially true for Langley's cost management accounting team, which monitors the center's several million dollars worth of contracts with outside vendors.

Operating under the Core Financial environment has also meant many changes to business practices within financial management, which the center continues to test and refine with the help of its consultant staff. One area in particular that has undergone many changes and improvements is cost management.

Cost Management at NASA Langley

NASA's total budget for fiscal year 2004 is $15.47 billion.[2] Currently, approximately 87 percent of NASA's budget is contracted out to its several vendors, who provide everything from engineering services, supplies and equipment, to material goods, research and consulting, all in support of NASA's missions.[3]

NASA's centers, including Langley, use what is called the NASA Form (NF) 533 report to monitor contractor costs on both a monthly and quarterly basis. NASA is different from other federal agencies in the use of this cost-monitoring tool, which was developed to address a long history of contractor overruns. The 533 report allows NASA to track contractor costs on a monthly basis, forecast cost trends and validate actual costs before disbursing funds based on contractor invoices. The 533 report is used for contracts with a total value of $500,000 or more, although its use can be stipulated in any NASA contract. Contracts that are under the $500,000 threshold can accrue cost based on a pure straight-line method. Other methods of applying cost include adjustments based upon receipt and inspection of material goods, and miscellaneous cost accruals required to pay a contractor invoice (legacy financial management systems at NASA did not allow for the disbursement of funds in amounts greater than accrued cost). Under the legacy system, Langley performed a quarterly review of all contract obligations that had not accrued new cost to ensure that all costs were updated and validated. Generally, this involved delivery order contracts for material and supplies.

The bulk of Langley's contractor costs, however, are accounted for on the 533 report. Analyzing the monthly 533 report is also the largest and most time consuming task of the cost accounting team.

Components of the NF-533 report—Current, Cumulative and Estimated Cost

The NF-533 report provides three critical pieces of cost management information:

- Current month's actual cost (during month, column 7.a)
- Cumulative actual cost to date (column 7.c)
- Estimated cost for the next month and next month plus one (columns 8.a and 8.b)

This data is used to calculate the monthly cost accrual for any given contract. Often, the contract is divided into several independent tasks, the total of which should equal the summary amounts reported on the cost report. For these contracts, the cost accrual for each task is calculated, and a total is generated to ensure that the contractor is reporting accurate totals.

Since the 533 report arrives at Langley during the month following the close of the prior month's accounting period (typically, this is 10 business days after the close, as required by the contract, but it can vary), the cost accrual must take into account the current month to post the most up-to-date amount for the month in which the accrual is posted. This is the purpose of the "estimated cost for next month" column, whereby the cost accountant can generate cost accruals that reflect the most current data.

This is, of course, a manual process, and involves the following calculation:

Cumulative Actual Cost + Estimated Cost for Next Month - Previously Posted Cost in FMS

The financial management system served as Langley's legacy financial accounting system, dating back to 1976, and was replaced by the Core Financial system in June 2003. The monthly cost accrual is based on the cumulative actual cost (through the end date of the report) plus the estimated cost for the next month minus what was previously accrued in.

The accuracy of the cost accrual is dependent on the accuracy of the contractor's estimated cost for the two months following the end of the reporting period. This is a key consideration since Langley uses accrued cost as a basis for paying invoices. Overstatement of cost can result in over-disbursement. To prevent this, NASA established a 5 percent variance tolerance, which is outlined in its contracts. Variances are analyzed closely, particularly for the 10 largest contracts in total dollar value.

Cost Accrual Procedures under Legacy Systems—Labor- and Paper-Intensive

Langley Research Center's procedures for generating and posting monthly cost accruals under its legacy systems were labor- and paper-intensive, and required extracting data from multiple sources. Such procedures allowed for more human error, and made it difficult to conduct a proper audit of contractor costs.

The cost accountant assigned to a particular contract received the monthly NF-533 report from the contractor. The 533 report was entered into a FoxPro database called the Monitored Documents Database System. This internal database was used to track 533 report timeliness, as well as to record cost accrual amounts and monthly variances. *Figure 1* shows the tasks and systems/software involved.

Special circumstances included situations in which the contractor was reporting cost in excess of obligation, or a reduction of cost is required if the report does not support the cumulative accrual. Reductions could result when the contractor reduced cost amounts previously reported to NASA, or when the estimate for the next month exceeded the actual cost incurred during that month.

The Acquisition Management System (AMS) contained key data that an accountant would regularly require, such as the contract period of performance, type of contract, total contract value, contracting officer information and contract status (active, closed, etc.). AMS, although linked to the financial accounting system, was a separate system requiring access to several screens before getting to the desired information.

Figure 1

Step Number	Required Task	System(s) or Software Involved
1.	Receive and review the NF-533 cost report. Enter primary cost report data into MDDS.	Monitored Documents Database System (MDDS)
2.	If no cost report received, verify that the contract is not in close-out status.	Acquisition Management System (AMS)
3.	If the cost report is for a new contract, ensure that a "cost accrual flag" is set in FMS.	FMS
4.	Contact the contracting officer or the contractor if problems or discrepancies exist on the cost report.	None
5.	Verify that calculations are accurate at the summary and task levels.	FMS, Excel spreadsheet
6.	Calculate cost accrual manually (using calculator and pencil to show calculation)	FMS, Excel spreadsheet, calculator
7.	Generate unique task accruals for task order contracts, and verify accuracy of summary totals.	Task spreadsheet (Excel), calculator, FMS
8.	Update Cost Accrual Worksheet to reflect monthly accrual amounts	Excel spreadsheet, CAW
9.	Post cost accruals for legacy system.	Task spreadsheet (Excel), calculator, FMS
10.	Enter cost accrual data into external databases.	MDDS
11.	Notify contracting officer of special circumstances (excess cost, etc.)	Task spreadsheet (Excel), FMS, e-mail

Figure 2

Step Number	Required Task	System(s) or Software Involved
1.	Check for new funding lines (Funding Classification Structure) and map accordingly.	Core Financial (CCR Crosswalk)
2.	Accept and review the NF-533 report for the month.	Core Financial (CCR Cost Entry Sheet)
3.	Enter NF-533 report cost data into Core Financial.	Core Financial (CCR Cost Entry Sheet)
4.	Generate cost accrual amounts.	Core Financial (CCR Cost Entry Sheet and Worksheet)
5.	Determine CIEO or downward adjustment amounts.	Core Financial (CCR Worksheet)
6.	Post cost accruals to financial management system.	Core Financial (CCR Worksheet)

Reconciling the Contract Cost Report and the Task Spreadsheet to FMS

Perhaps the most labor-intensive process of the monthly cost accrual, and the most vulnerable to mathematical error, involved reconciling the cost report and the task spreadsheet to the current accrued cost.

The task spreadsheet was an off line, reflecting the cost data contained in the accounting system by line of accounting and by task. This spreadsheet was critical to generating cost accruals because it allowed the accountant to enter the cost data from the 533 report, by task, and generate the monthly cost accrual amount. This external document was necessitated by the fact that the legacy system often grouped several lines of accounting together, and did not group them according to the tasks outlined in the contract. Since cost was reported by the contractor for several distinct tasks, this was the only method to differentiate cost by task.

The task spreadsheet also includes a column for the cost accountant to calculate either excess cost or a required reduction in cost. This is determined by the total cost for a particular task, its total obligation amount and the amount previously accrued. Since it is Langley's policy to not accrue cost in excess of obligation, this task spreadsheet served as the only record of excess cost, by amount, by task. And since it required accurate entering of cost data, as reflected on the cost report, as well as accurate formulae in the spreadsheet, the possibility for human error was high.

The 533 report total accrual amount matches the amount reported by the contractor. The un-costed obligation amount reflects the total amount for that task that can still be accrued.

Under the legacy financial system, once task accruals were calculated using the spreadsheet, these amounts were entered into the financial management system. A task order contract would involve twice as many manual calculations and twice the level of effort to post the accruals.

Additionally, cost accounts entered primary cost report data as well as cost accrual amounts into another external spreadsheet, the Cost Accrual Worksheet. This worksheet was used by the lead cost accountant to review the cost accrual amounts and update another database. For accurate posting of cost data, this database was critical since that database generated cost report timeliness reports and cost variance analysis spreadsheets. Once a cost accrual was generated, it could be recorded in as many as four places—the task spreadsheet, the accounting system, cost accrual worksheet and an external database.

Core Financial Go-Live, June 2003— Moving from Multiple Systems to One

By May 16, 2003, most of Langley's financial management legacy systems were decommissioned—the legacy accounting system was closed to all transactions other than simple data queries (it exists today for that sole function), the MDDS database was shut down, and both the task spreadsheet and cost accrual worksheet were no longer used. During the period between June 7 and June 23, 2003, Langley's cost management team worked diligently to "map" all of the accounting lines that had been converted to Core Financial, ensuring that obligation and cost accrual amounts in the legacy system were fully accounted for in Core Financial. This was no small task given that some contracts had more than 500 assigned tasks.

Benefits that the center is experiencing from an integrated system include:

- *More efficient accounting procedures resulting in a cost savings to the agency.*
- *A reduction in the error rate resulting in a higher level of data accuracy.*
- *More simplified audit and reconciliation procedures.*

The mapping process involved the use of spreadsheets that reflected how each line of each contract was converted to lines from the legacy system to Core Financial. Accounts followed these spreadsheets to assign lines of accounting within Core Financial, ensuring that obligation and cost amounts captured at the time of legacy shut down were accurately reflected in Core Financial. At the end of the process, success meant amounts for both obligation and cost matched. For very large task contracts, this took several days to accomplish because every line of accounting needed to also be assigned to its respective task. In the end, this contract mapping process proved successful and timely for go-live. Months after, however, Langley did discover some cases of mis-mapping, which has required some corrections within Core Financial (in these cases, the totals added up, but some lines were incorrectly assigned).

Because of the "integrated nature" of Core Financial, cost accounting has now been reduced to one system to record cost report data, generate cost accruals and post accounting data to

the financial management system (now known as the Core Financial system). Gone are the external spreadsheets and ancillary databases. The 533 report is now known as the Contractor Cost Report. Thanks to the CCR "extension," cost entry and crosswalk sheets are provided within one system to enter cost report data, map funding lines to a crosswalk, generate accruals and review accounting data prior to posting.

Figure 2, showing cost accrual activities under Core Financial, demonstrates this.

The CCR Cost Entry screen, shown in *Figure 3*, replaces the task spreadsheet and cost accrual worksheet and generates cost accruals, which are subsequently posted to Core Financial.

Critical success factors in implementing IFMP at NASA Langley include:

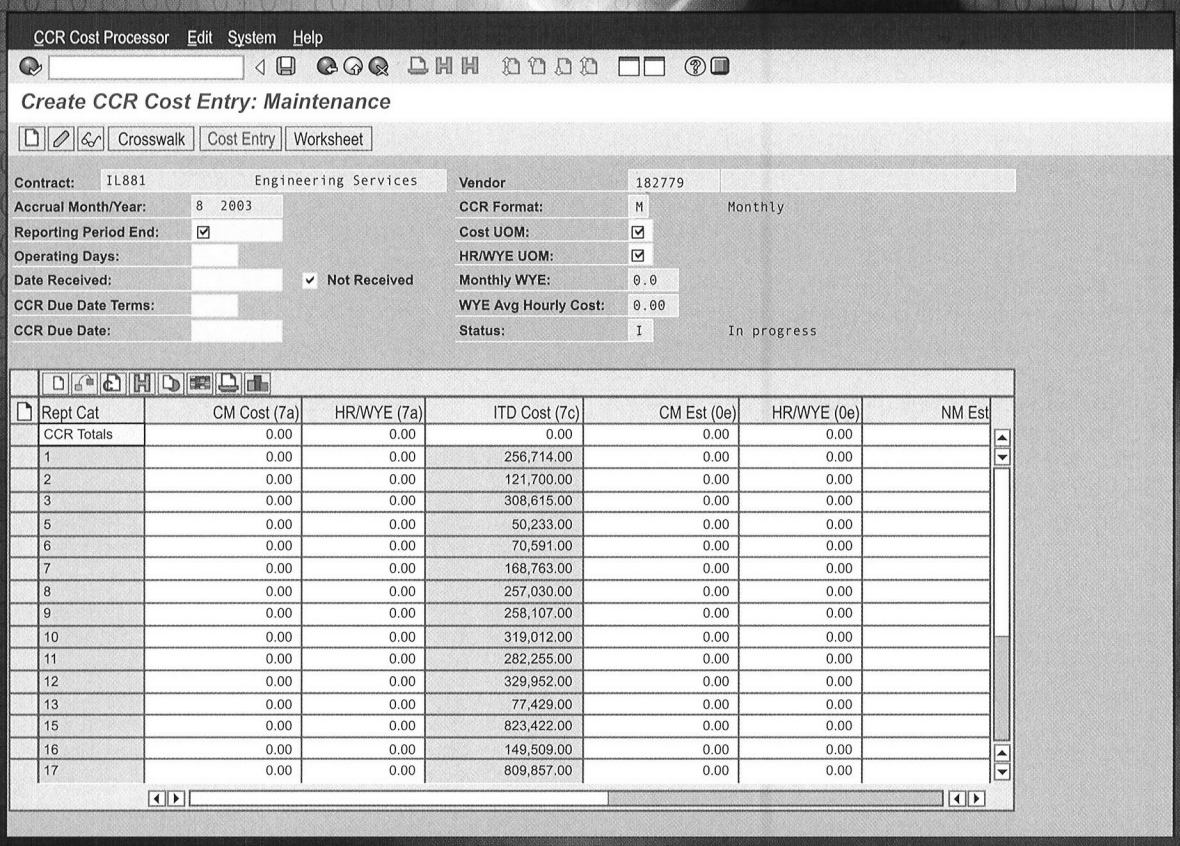
- *Both the agency and the center's commitment to the goals of the program in the form of resources and time.*
- *A phased approach to the conversion to Core Financial, allowing centers to learn from others' experiences.*
- *Assembling a team of professionals possessing the right mix of financial and technical skills.*

Increased Accountability—Contractor Cost Data and Core Financial Limitations

The implementation of the Core Financial solution has also meant further accountability on the part of the contractors because the program will not post either cost in excess of obligation or a downward adjustment. Financial analysts and contracting officers can review cost in excess of obligations and downward adjustment data within the CCR worksheet, or generate a report using the Business Warehouse options, but these amounts are not posted to Core Financial. When an excess cost condition exists, the contracting officer is notified per center policy. The contracting officer determines whether the excess cost will be resolved through additional funding or if the contractor will absorb the cost. If additional funding is added, Core Financial will reconcile the excess amount and no longer reflect excess cost. If the contractor is going to absorb the cost, a revised CCR is provided to NASA that reflects the reduction in cost. Still, this will require closer variance scrutiny on the part of NASA officials to prevent the over-disbursement of funds.

Now just past its first full year of the Core Financial solution, Langley is still in a learning curve. It is clear, however, that the probability of accountant error has been significantly reduced as the systems involved in the cost accounting process move from "many" to "one." The anticipated release of the electronic cost report, which will populate cost data via an extraction process replacing manual entry, will only contribute to

Figure 3



Rept Cat	CM Cost (7a)	HR/WYE (7a)	ITD Cost (7c)	CM Est (0e)	HR/WYE (0e)	NM Est
CCR Totals	0.00	0.00	0.00	0.00	0.00	
1	0.00	0.00	256,714.00	0.00	0.00	
2	0.00	0.00	121,700.00	0.00	0.00	
3	0.00	0.00	308,615.00	0.00	0.00	
5	0.00	0.00	50,233.00	0.00	0.00	
6	0.00	0.00	70,591.00	0.00	0.00	
7	0.00	0.00	168,763.00	0.00	0.00	
8	0.00	0.00	257,030.00	0.00	0.00	
9	0.00	0.00	258,107.00	0.00	0.00	
10	0.00	0.00	319,012.00	0.00	0.00	
11	0.00	0.00	282,255.00	0.00	0.00	
12	0.00	0.00	329,952.00	0.00	0.00	
13	0.00	0.00	77,429.00	0.00	0.00	
15	0.00	0.00	823,422.00	0.00	0.00	
16	0.00	0.00	149,509.00	0.00	0.00	
17	0.00	0.00	809,857.00	0.00	0.00	

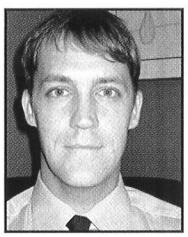
accountant accuracy. So far, Core Financial has clearly met the center's expectations, and the overall goals of the IFM program. Of course there are growing pains; a cost accountant can encounter a posting error at 9 p.m. on the closing date, which was ultimately caused by an error in the requisition process several steps earlier in the accounting life cycle. But given the higher rates of accuracy and less redundancy in task performance, Langley and NASA as a whole are both headed in the right direction.

The Langley Research Center has learned key lessons during the implementation of IFMP:

- *A truly integrated system means that the tasks performed by one organization directly affect another—an error made during the procurement process can impede tasks performed by cost accounting.*
- *Working with Core Financial has involved a learning curve for the user community that improves as users become more proficient*
- *Phasing in the agency's new electronic CCR (eCCR) during FY 04 will allow for more testing and perfecting the process.*

End Notes

1. NASA Langley Integrated Financial Management Program website, *http://ifmp.larc.nasa.gov/news/index.cfm*, August 2003.
2. President's FY 2004 Budget Request, National Aeronautics and Space Administration.
3. GovExec.com, Beth Dickey, August 15, 2003, *www.govexec.com/features/0803/0803s5.htm.*



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