

DEPARTMENT OF EDUCATION-FSA
FMS INTEGRATION PARTNER
INTERFACE FUNCTIONAL DESIGN



FMS SPLITTER REDESIGN PROGRAM
TO 128 – FMS TO FMSS DATA TRANSFORMATION
AND TRANSFER

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Subject: Splitter Redesign Program Functional Design
Phase: TO 128 – FMS to FMSS Data Transformation and Transfer
Version: 6.0

Prepared by: Preston White	Date: March 20, 2003
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Document Change Control

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Approval

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Team Lead Sign Off:	John Kim	202-962-0702	Sign Off Date: 03/21/2003
Project Lead Sign Off:	Jen Alden	202-962-0682	Sign Off Date: 03/24/2003
FSA Representative Sign Off:	Shirley Pratt	202-377-3491	Sign Off Date:



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Specification

Program Name:	FMS Splitter Redesign Program
Functional Design Document ID & Title:	FMS_SPLITTER_REDESIGN_PROGRAM_FD
Application:	FMS Oracle AP FMS Oracle AR FMS Oracle GL
Priority:	High
Estimated Production Date:	June 2003
Other Affected Applications:	LARS (Lender Reporting System) Forms 2000 Mellon Lockbox
Comments:	



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General Requirements

Business Objective:

As part of TO 128, FMS has been tasked to redesign the Splitter process. Currently, financial data associated with FFEL Lender and FFEL GA is processed by FMS. Specifically, the financial data is processed in the Accounts Payable (AP) module, the Accounts Receivable (AR) module or the General Ledger (GL) module depending on the transaction type and the source of the data. As each line of financial data enters the AP, AR, and GL modules, it is associated with a fund value for accounting purposes. For data related to FFEL Lender and FFEL GA the fund value of 4251XNY is applied.

The objective of the splitter redesign program is to take the lines of the financial data that have been applied to the Financing fund (4251XNY) and split them into two lines prior to being processed in the AP, AR or GL sub ledgers. One line is for the Financing fund (4251XNY) and the other line is for the Liquidating fund (0230XNY). Based on the splitter process, the data on the fund 4251XNY line will be changed from the original transaction line and the fund 0230XNY line will be created as a new line.

The splitter redesign program will only affect the following transactions:

- FFEL Lender and FFEL GA transactions in the AP module
- FFEL Lender transactions in the AR module
- FFEL GA transactions in the GL module

The process will require splitting all of these transactions for fund 4251XNY into 4251XNY and 0230XNY.

The transactions mentioned above will be provided by the following sources:

- LaRS Interface
- Mellon Lockbox Interface
- Forms 2000

When the lines of the financial data are split between the two separate funds, it is important that the total monetary amount of the two new data lines equals the value of the original line from which the split was made. The percentage of the original data line amount that is split into the two new data lines will not be the same for every line. For this reason, a custom Allocation Table and Form will be created to list the percentages of the original data line that will be placed in fund 4251XNY and 0230XNY. Along with the Fund, the Object Class, the Limitation, and the Budget Fiscal Year from the original data line will be added to this custom table to maintain the proper allocation percentages. This creates further flexibility in how the splits are made. Rounding to the cent may be necessary during the splitter process. The purpose of rounding is to ensure that the two amounts of the split transactions will agree to the amount of the original transaction line. Refer to the Splitter Allocation Table & Form functional design document for more details on the custom table and form.

Component Description:

To fulfill the Business Objective, the splitter redesign program will include the use of triggers on the database tables, which will be activated when a record is created with a fund value of 4251XNY in the AP, AR, or GL module. These triggers will be placed on the Oracle Open Interface Tables that are used to load transactions into the AP, AR, or GL modules. When a record from an eligible source is created with a fund value of 4251XNY and a Cohort Year value of PS in one of the interface tables, the trigger will call the Splitter PL/SQL Package to split the transaction. The PL/SQL Package will split the record applied to fund 4251XNY into funds 4251XNY and 0230XNY in the interface table. The allocation of funds for these splits will be derived from a custom Allocation Table, which is updated with values provided by Budget Service through a custom Allocation Form. The split will be completed before the Oracle Open Interface Program is executed, which imports the transactions into the AP, AR and GL base tables. A split will be performed on all transactions from an eligible source that are mapped to both 4251XNY fund and PS Cohort Year.



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AP Database Trigger: This trigger will reside on the AP_INVOICE_LINES_INTERFACE table. This table is the Oracle Open Interface table for invoice lines in the AP module. This trigger will process every line that is inserted into the table and determine if the fund for that line is 4251XNY, the Cohort Year is PS, and the transaction is FFEL Lender or FFEL GA related. If true, then the trigger will call the proper functions and procedures from the Splitter PL/SQL Package to properly split the line into two lines in the AP_INVOICE_LINES_INTERFACE table. (See Requirement 2.1 of the Requirements Matrix)

AR Database Trigger: This trigger will reside on the RA_INTERFACE_DISTRIBUTIONS_ALL table. This table is one of two Oracle Open Interface tables for lines in the AR module. This trigger will process every line that is inserted into the table and determine if the fund for that line is 4251XNY, the Cohort Year is PS, and the transaction is FFEL Lender related. If true, then the trigger will call the proper functions and procedures from the Splitter PL/SQL Package to properly split the line into two lines in both the RA_INTERFACE_DISTRIBUTIONS_ALL and RA_INTERFACE_LINES_ALL tables. (See Requirement 2.2 of the Requirements Matrix)

GL Database Trigger: This trigger will reside on the GL_INTERFACE table. This table is the Oracle Open Interface table for invoice lines in the GL module. This trigger will process every line that is inserted into the table and determine if the fund for that line is 4251XNY, the Cohort Year is PS, and the transaction is FFEL GA related. If true and the line has not been passed through AR or AP already, then the trigger will call the proper functions and procedures from the Splitter PL/SQL Package to properly split the line into two lines in the GL_INTERFACE table. (See Requirement 2.3 of the Requirements Matrix)

Splitter PL/SQL Package: This package will contain all of the functions and procedures that are required to look up proper allocation percentages and split lines in the AP, AR and GL modules. The database triggers will invoke these functions and procedures.

Component Risks:

1. Potential performance issues with database triggers. Risk has been discussed and determined to be minimal since the interface table is cleared each time an Oracle Open Interface Program is executed for that particular table.

Authorization:

N/A – The program will be initiated by triggers on the interface tables.

Scheduling Requirements:

N/A – The program will be initiated by triggers on the interface tables.

Volume:

Each financial transaction that uses 4251XNY fund, PS Cohort Year, and is from an eligible source will be processed. This volume will vary.

Frequency:

Program will run whenever an interface program is attempting to insert records that use 4251XNY fund and PS Cohort Year into the interface tables.

Development Complexity:

High

Assumptions:

1. Budget Service will provide up-to-date allocation information for the appropriate Fund, Object Class, Limitation, and Budget Fiscal Year.
2. 4251XNY fund transaction lines in the AP, AR and GL modules that have a PS Cohort Year are the only lines that will require splitting.



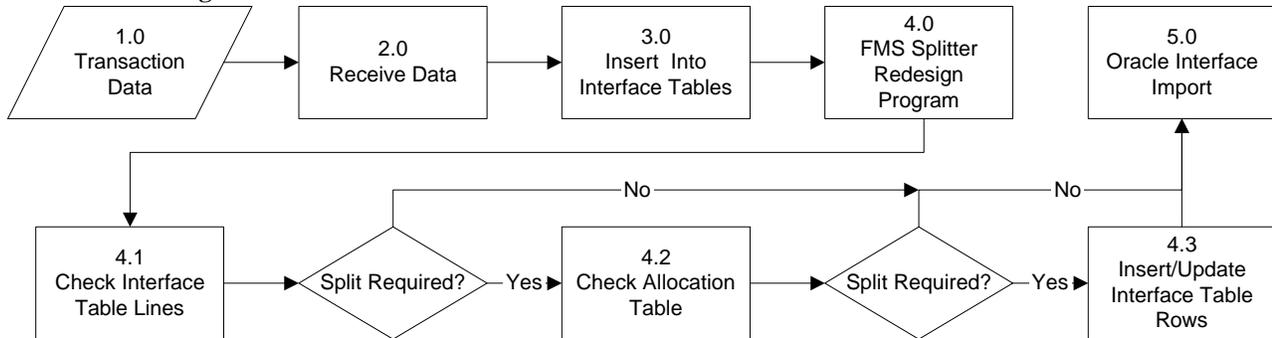
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3. 4251XNY fund transaction lines will only be split into only two lines, 4251XNY and 0230XNY. Therefore, splitting a line into three or more lines will not be possible without program modification.
4. All combinations of Fund, Object Class, Limitation, and Budget Fiscal Year will be listed in the Allocation Table for lines that have a PS Cohort Year.
5. Transactions using 4251XNY fund and PS Cohort Year will only exist for FFEL Lender and FFEL GA transactions.
6. The FMS Splitter Redesign program will only split transactions that are interfaced from LARS, Mellon Bank, and Form 2000 into the Oracle AP/AR/GL Open Interface tables. It will not split transactions related to FFEL Lender or FFEL GA that are entered manually through the FMS application forms.

Design

Process Flow Diagram:



Detailed Description of New/Changes to Existing Program:

- 1.0 Transaction Data – Financial data comes into FMS (AP, AR, GL) from a number of different sources including, but not limited to LARS, Mellon Bank, and Form 2000. No Changes will be made to this functionality.
- 2.0 Receive Data – Once the data has been received into the system, custom interface programs for LARS, Mellon Bank, and Form 2000 format the data for insertion into the AP, AR, or GL module depending on the data source and interface. No Changes will be made to this functionality.
- 3.0 Insert Into Interface Tables – Once data is formatted it is inserted into the proper Oracle Open Interface tables so that it can be properly imported into the Oracle AP, AR, and GL module base tables. No changes will be made to this functionality.
- 4.0 FMS Splitter Redesign Program – The FMS Splitter Redesign program is a new PL/SQL Package aided by database triggers that will look at lines that have been entered into the Oracle Open Interface Tables for AP, AR, and GL, and determine if further processing needs to be completed before the interface lines are imported into the Oracle Base Tables. For AP, the AP_INVOICE_LINES_INTERFACE table will be checked, for AR the RA_INTERFACE_DISTRIBUTIONS_ALL will be checked, and for GL the GL_INTERFACE table will be checked.
 - 4.1 Check Interface Table Lines – For each line that is entered into an interface table, a database trigger on that table will check to see if the fund used in that transaction is 4251XNY, if the Cohort Year for that transaction is PS, and if it is from an eligible source. If true, the Splitter Redesign PL/SQL program will be launched for that line. If not, then the Splitter Redesign PL/SQL program will not be launched and no changes will be made to the line.
 - 4.2 Check Allocation Table - In the Splitter Redesign PL/SQL program, the Fund, Object Class, Limitation, and Budget Fiscal Year information taken from step 4.1 will be used as a lookup in the Splitter Allocation table.



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It is from this table that it can be determined whether each line can be left as it is, or if it needs to be split into two lines, each having updated accounting, and transaction information. If a split were not required, the Splitter would move on and not make any changes to that line in the interface table.

- 4.3 Insert/Update Interface Table Rows - If a split is required, a copy of the interface line will be made, and then modification to both the existing line, and the new line will be made to reflect the changes prescribed in the allocation table.
- 5.0 Oracle Interface Import – Once data is in the Oracle Open Interface tables, a Standard Oracle Interface Import program is executed that brings data from the Interface tables into the Oracle Base tables. No changes will be made to this functionality as it is already handled in the custom interface programs.

Input Parameters:

Parameter Name	Datatype	Default Value	Required (Y/N)	Value Set	Comments
N/A					

Database Objects:

Database Object Name	Object Type	Oracle Application	Comments
SFALIB_GL_SPLITTER_TRG	Trigger	SFALIB	GL_INTERFACE
SFALIB_AP_SPLITTER_TRG	Trigger	SFALIB	AP_INVOICE_LINES_INTERFACE
SFALIB_AR_SPLITTER_TRG	Trigger	SFALIB	RA_INTERFACE_DISTRIBUTIONS
SFALIB_SPLITTER_REDESIGN_PKG	Package	SFALIB	Package called by Triggers to process transaction lines.

Dependencies

Dependencies on Other RICE Components:

- 1. Splitter Allocation Form/Table must be complete and functioning for the splitter to function properly.

Dependencies on Other Business Components:

- 1. FSA FMS Lenders AR/AP Master Invoice Program, which loads AR and AP Interface tables for FFEL Lender.
- 2. FSA FMS Lenders AR Lockbox Master Program, which loads AR Interface tables for FFEL Lender
- 3.
- 4. SFA FFEL GA Form 2000 AP/GL Load Interface, which loads AP and GL Interface for FFEL GA.

Design Constraints:

N/A

Performance Considerations:

- 1. Any use of table triggers must be handled cautiously to avoid having a negative impact on database performance. This will mean minimizing runtime and size.
- 2. Most interfaces are run nightly, so the FMS Splitter will only be running at night.



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Implementation Considerations:

N/A

Other Dependencies/Special Concerns:

N/A



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Error Handling

Potential Errors	Possible Reasons	Solution Strategy
Transaction lines are not split as desired.	-Trigger did not fire properly -Splitter Allocation Form not set up properly -Splitter encountered unexpected line data.	-Errors will be caught in interface. Thus errors must be corrected, and the interface must be rerun.
Lines that are split do not import properly into the Oracle Base tables.	- Oracle Open Interface Import program detected errors in the line.	-Manually Correct Errors, rerun Oracle Interface.
An allocation for a line that has fund type 4251XNY and Cohort Year of 'PS' does not appear in the allocation table.	-Allocation was not entered into the splitter allocation table.	- Proper info added into the splitter allocation table through the allocation form. - Rerun custom interface.

Testing Requirements

Test Condition	Expected Results
Each interface that inserts lines into AP that could use fund 4251XNY must attempt to insert a transaction for fund 4251XNY.	Line entered will be split properly based on the Splitter Allocation Table.
Each interface that inserts lines into AP that could use fund 4251XNY must attempt to insert a transaction that is NOT for fund 4251XNY.	Line NOT split.
Each interface that inserts lines into AR that could use fund 4251XNY must attempt to insert a transaction for fund 4251XNY.	Line entered will be split properly based on the Splitter Allocation Table.
Each interface that inserts lines into AR that could use fund 4251XNY must attempt to insert a transaction that is NOT for fund 4251XNY.	Line NOT split.
Each interface that inserts lines into GL that could use fund 4251XNY must attempt to insert a transaction that is NOT for fund 4251XNY.	Line entered will be split properly based on the Splitter Allocation Table.
Each interface that inserts lines into GL that could use fund 4251XNY must attempt to insert a transaction that is NOT for fund 4251XNY.	Line NOT split.

Issues and Additional Considerations

The following Issues were defined during Functional Design:

Issue	Raised By / Date Needed	Resolution/Answer	Resolved By / Date Completed
Will lines that are to be allocated 100% to one fund, and 0% to another fund require splitting?	P. White / 2/28/2003	No separate line needs to be created for a 0230XNY fund if the Splitter Allocation Table indicates that it has a 0% allocation	B. Hills / 2/24/2003
In the SFA Accounting Segments screen, will there ever be more than one Fund listed for each Item name?	P. White / 2/28/2003	No, each item is only associated with one fund. This fund will be used to look up the split allocation in the allocation table.	B. Hills / 2/11/2003



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Issue	Raised By / Date Needed	Resolution/Answer	Resolved By / Date Completed
Currently the Fund 4251XNY appears in the following SUBSYSTEMS of the SFA Accounting Segments screen: MONTHLY, LENDER, NSLDS, QUARTERLY, VFA_FEES, VFA_WEEKLY, FFEL Will we be required to split every single transaction that uses fund 4251XNY regardless of source?	P. White / 2/28/2003	No. Only transactions with Fund 4251XNY and Cohort Year of 'PS' need to be split. And they only need to be split if they are from an eligible source.	B. Hills / 2/26/2003
What does it mean "Ability to have the option to split to the Object Class, Activity or Cohort Year Level"?	P. White / 2/28/2003	This has been slightly changed. The allocation table will have allocations for each combination of Fund, Object Class, Limitation, and Budget Fiscal Year. Splits will only occur if the Cohort Year is 'PS'.	B. Hills / 2/11/2003
What should the splitter do if an allocation cannot be found for a particular combination of Fund, Object Class, and Limitation?	P. White / 2/28/2003	This is an error. Raise an exception. The exception will be raised back to the interface program that attempted to insert the line. When the interface program ends in error, the user will be able to read the error message in the LOG file. The Splitter Allocation Table should be updated accordingly, and then the interface program can be executed again.	B. Hills / 2/26/2003