

Case Study: Balancing by 2 Segments in Release 12.1.3 of Oracle E-Business Suite

Authors

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Abstract

This paper describes the Custom solution that General Electric (GE) implemented in collaboration with Oracle to achieve Balancing by 2 segments in Release 12.1.3 of Oracle E-Business Suite (EBS). GE has the business need to Balance by both the Legal Entity (LE) and Management Entity (ME) segments in the Chart of Accounts. While Fusion Applications allow Balancing by 3 segments, Oracle EBS Applications do not have this Functionality. This paper covers the requirements and solution in detail for 2 Segment Balancing.

Learning Objectives

1. Learn more about Standard Oracle Balancing for both Sub-ledger Accounting (SLA) and General Ledger.
2. Gain in-depth knowledge of how Standard Oracle Balancing works in release 12.1.3 including the Tables used by the Balancing API.
3. Learn about the 3 controlled Patches that Oracle provided to enable the custom solution.
4. Learn about the Factors that contributed to making this Custom solution successful at GE.

Introduction

General Electric (GE) launched an initiative in 2012 to define and implement Enterprise-wide standards to standardize and simplify globally for key operational and financial transactions. As part of these Enterprise standards, GE defined a global Chart of Accounts that all the ERP (Enterprise Resource Planning) implementations must use. The Enterprise Standards Chart of Accounts contains a number of segments, the first two being the Legal Entity (LE) and Management Entity (ME). These 2 segments are relevant for this case study. The Legal Entity segment represents the Legal Identifier for Tax or Statutory purposes.

GE has a number of businesses operating in more than 100 countries around the world. GE's major businesses include Capital, Oil & Gas, Power & Water, Healthcare, Aviation, Appliances & Lighting, Transportation and Energy Management. Each of these major businesses is comprised of sub-businesses. For example, Power and Water has 6 Tier 1 P&Ls (Profit and Loss Centers), including Power Generation, Renewables, Nuclear, Distributed Power and Water. Businesses/sub-businesses can share Legal Entities. For most of the businesses, the ME segment represents a division within a business/sub-business. Some of the businesses are using the ME to differentiate between Product lines or other important business specific measurements.

Requirements

In order to generate a balanced Trial Balance at both the country/statutory level and business/P&L level, GE has the requirement to Balance by both the Legal Entity (LE) and Management Entity (ME) segments in the Chart of Accounts with specific rules on how to handle within LE and cross-LE transactions. While Fusion Applications allow Balancing by up-to 3 segments, Oracle EBS Applications do not have this Functionality. In one of the 11i ERP implementations at GE, the requirement to balance by 2 segments was satisfied by bringing the balancing entries into the GL Interface tables. This approach had limitations and did not meet all the business requirements. In another 11i implementation, this requirement was met by concatenating the LE and ME into 1 segment in the Oracle Chart of Accounts. It then had to be broken up

into separate segments for reporting and sending to the consolidation Ledger. With the launch of Enterprise Standards Chart of Accounts, GE needed a robust dual Segment Balancing solution that would work across multiple ERP implementations of Oracle EBS Release 12 across the company. The requirements that the solution needed to satisfy include the ability to balance for all Journal Sources such as Sub-ledger created Journal Entries, manual Journal Entries, General Ledger (GL) Allocations, and GL Integrations. Also, the Balancing lines need to be included with the original journal. Balancing should be created such that the Ledger is balanced at all times, not just at month-end close.

GE reached out to Oracle to get help to come up with a robust solution. A number of people collaborated across GE and Oracle to implement a custom solution that GE developed, with Oracle providing 3 Patches to enable this solution.

Solution Overview

In Release 12, a new Intercompany balancing engine (Balancing API) was introduced which is called by SLA Create Accounting and GL Posting Programs when journals are not balanced. This engine places unbalanced lines into the Global Temporary Table (FUN_BAL_HEADERS_GT and FUN_BAL_HEADERS_LINES_GT), logic is run and additional entries are placed in another temporary table (FUN_BAL_RESULTS_GT). See **Appendix 1** for Table definitions.

SLA or GL Posting Programs pick up the extra lines and add to the journals.

To enable the custom solution, at the beginning of the balancing engine processing, Oracle added a call out to a custom PL/SQL package. GE created the custom logic to insert in this package. GE's custom logic creates the balancing lines. The following steps occur:

1. The Calling Programs (SLA Create Accounting or GL Posting) populate the Global Temporary tables with the unbalanced lines (FUN_BAL_HEADERS_GT and FUN_BAL_HEADERS_LINES_GT) and invoke the Balancing API
2. The Balancing API invokes the GE Custom Code
3. GE custom code then runs its own logic and generates its own balancing lines
4. Return control to SLA Create Accounting or GL Posting for normal Oracle processing

Oracle provided patches to make the call to GE Custom Code possible from the Balancing API for both SLA Create Accounting and GL Posting Programs. The Patches rely on the Secondary Balancing Segment (ME) having the Secondary Tracking Qualifier enabled. This gives SLA Create Accounting and GL Posting Programs a simple way to trigger the Balancing API for the situation when the Journal is out of Balance by the Management Entity (ME) segment. GE designated the LE as the Primary Balancing Segment and ME as the Secondary Segment.

Balancing API Patch

Balancing API patch 17325813:R12.FUN.B adds the functionality to call a Custom Package by utilizing a Profile Option.

Profile Option Name: FUN_ENABLE_BALANCING_CUSTOM_API

- Create the profile listed below:
Go to "Application Developer" -> Profile -> create new profile with
Name : FUN_ENABLE_BALANCING_CUSTOM_API
Application : Financials Common Modules
User Profile Name : FUN: Enable custom balancing
Description : FUN: Enable custom balancing
Active Dates Start : 01/01/1951
All check boxes should be checked.
Save it.

- Create a custom package/procedure where the customizations will be implemented. (e.g. XXX_CUSTOM_BALANCING_PKG.MAIN)
Enter the name of the package in the profile option.
Go to "System Administrator" -> Profiles -> System ->
Query the system profile "FUN: Enable custom balancing"
Enter the custom procedure name in the value field. (e.g. XXX_CUSTOM_BALANCING_PKG.MAIN)

GE custom code creates its own balancing lines.

GL Posting Patch

GL Posting Patch # 16663728:R12.GL.B adds the following functionality:

If the Profile Option: FUN_ENABLE_BALANCING_CUSTOM_API is set, then this patch:

1. Populates the input tables with unbalanced lines for both segments
2. Invokes the Balancing API for both segments, not just the Primary Balancing segment
3. Skips Oracle rounding logic. The skipping of Oracle rounding logic is needed so that GE custom code can do the rounding for both segments, not just the Primary segment.
4. Skips Oracle Intercompany Balancing.

SLA Create Accounting Patch

SLA Patch # 17028916:R12.XLA.B adds the following functionality:

If the Profile Option: SLA Custom: Generate Balancing Journals is set to Yes, then this patch:

- 1) Populates the input tables with unbalanced lines for both segments
- 2) Invokes the Balancing API for both segments, not just the Primary Balancing segment
- 3) Bypasses the following steps in standard SLA code
 - a. Balance by Ledger Currency
 - b. Intercompany Balancing
 - c. Cross Currency Balancing
 - d. Balancing by encumbrance
 - e. Rounding logic

Solution details are as follows:

1. The SLA Custom Profile Option needs to be defined using Application Developer:

```
Go to Application Developer and define Profile XLA_CUSTOM_BAL_JOURNALS
SQL="SELECT meaning \"Generate Custom Journals\",lookup_code
INTO :visible_option_value,:profile_option_value
FROM xla_lookups
WHERE lookup_type ='XLA_YES_NO'
COLUMN=\"\"Generate Custom Journals\"(*)"
```

Set Profile SLA Custom: Generate Balancing Journals to Yes

2. If profile is set to "Yes", Oracle SLA code calls new procedure balance_journals_custom which is created for purpose of customization. SLA inserts all journals accounted in current run into FUN_BAL_HEADERS_GT/FUN_BAL_LINES_GT and invokes the Balancing API.

3. GE Custom code reads journals from input GT tables, creates custom balancing lines and inserts these into FUN_BAL_RESULTS_GT
4. Since custom code generates various types of balancing lines, Oracle SLA code needs a way to distinguish what journals were created. Custom code inserts following Balancing Type in fun_bal_results_gt:

<u>Code</u>	<u>Meaning</u>
C_FUN_INTRA	Intracompany Balancing Journal
C_FUN_INTER	Intercompany
C_FUN_XLA	Entered Currency Balancing Journal
C_FUN_RND	Rounding Journal

If there are any errors, custom code inserts rows into fun_bal_errors_gt with appropriate error code. SLA reads from this table and marks journals in error. See **Appendix 2** for a listing of error codes that can be used.

Custom Logic

GE custom logic takes care of creating Cross Currency and Rounding lines in addition to 2 segment Balancing. Oracle Patches bypass the Cross Currency and Rounding functionality of Oracle Code.

Cross Currency

For Cross Currency, the assumption is that Cross Currency transactions will be allowed to come in from Oracle sub-ledgers only. For non-Oracle sub-ledgers, if Entered Debits < > Entered Credits, the entire file will be rejected.

1) Is Journal from Subledgers?

No --> Move to Step 2

Yes --> Continue to Step 1.1

1.1) Sum by Currency for Entered Dr/Cr and Accounted Dr/Cr for each currencies? 1.2) Does Entered Dr = Entered Cr for

Yes --> Move to Step 2

No --> Continue to Step 1.3

1.3) Ignore Summations where Entered Dr = Entered Cr

1.4) For Remaining lines, sum by Currency/LE/ME for both Entered Dr/Cr and Accounted Dr/Cr

1.5) Ignore Summations where Entered Dr = Entered Cr

1.6) For remaining Currency/LE/ME lines, add two JE lines:

A) To Realized Gain/Loss account within that LE/ME, opposite color in Source Currency with line Entered & Summation Accounted

B) To Realized Gain/Loss account within that LE/ME, same color in Ledger Currency with line Accounted as both Entered & Accounted

Rounding

2) Does Accounted Debits = Accounted Credits?

Yes --> Move to Step 3

No --> Continue to Step 2.1

2.1) Sum by LE Segment/Currency for Entered Dr/Cr and Accounted Dr/Cr

2.2) Ignore Summations where Entered Dr = Entered Cr AND Accounted Dr. = Accounted Cr.

2.3) For each summation where Entered Dr = Entered Cr. BUT Accounted Dr <> Accounted Cr., in same currency, create 0 Entered, Difference Accounted JE line to largest Debit CCID

- 2.4) Resume remaining lines not handled in 2.3 and 2.4 by currency only for both Entered Dr/Cr and Accounted Dr/Cr
- 2.5) For each currency, create 0 Entered, Difference Accounted JE line to largest debit CCID. If currency is the same as currency of the ledger, entered amount should be the same as the accounted amounts.

Balancing

- 3) Summarize each Journal by LE Segment and ME Segment.
- 4) Program will review summary, if journal is already balanced by LE and ME segment program will go to Step 7.
- 5) Program will review summary, if LE segment values net to zero, for each journal line the program will insert an offsetting balancing line using the Affiliate Current Account Program will sum remaining journal lines by LE and ME combination and insert an offsetting balancing line using the Due To and Due From accounts.
- 6) Program will re-summarize journal lines and validate the following:
 - a. Journal is balanced by LE Segment value
 - b. Journal is balanced by ME Segment value
 - c. Default balancing ME journal lines sum to zero by Natural Account.If validations are passed Program will move to Step 7, if validations fail program should error and send a notification that balancing program has failed.
- 7) Program will generate a Report showing additional lines created from original journal. This report will be sent to a central storage location.
- 8) Create Accounting or GL Posting program completes

This custom solution underwent rigorous testing for various scenarios, ranging from simple to complex.

Conclusion

This solution is elegant because it meets all of GE business requirements for Balancing, Cross Currency and Rounding by 2 segments for all Journal sources, including at the SLA level, along with allocations and manual Journal Entries and GL integrations.

This solution went live in Production for one of the ERP implementations for GE Power Generation business in August 2013. Subsequently, it was deployed in an existing R12 instance for GE Oil & Gas business.

Success factors of this solution include the fact that the business requirements were defined by GE Finance Teams at a very detailed level for Inter and Intra Company Balancing, Rounding and Cross Currency scenarios. Also, the solution underwent rigorous Testing before being deployed in Production for a number of different scenarios, including a situation where one Operating Unit was attached to a Ledger that had multiple Legal Entities. Most importantly, the people who worked on this solution collaborated very well as part of a cross functional Team that was very interested in making this successful.

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APPENDIX 1

Intercompany Balancing
Input Tables:

FUN_BAL_HEADERS_GT

Name	Datatype	Length	Mandatory	Comments
GROUP_ID	NUMBER	(15)	Yes	Group Identifier
LEDGER_ID	NUMBER	(15)	Yes	Ledger Identifier
JE_SOURCE_NAME	VARCHAR2	(25)	Yes	Journal Source Name
JE_CATEGORY_NAME	VARCHAR2	(25)	Yes	Journal Category Name
GL_DATE	DATE		Yes	Gl Date
CLEARING_BSV	VARCHAR2	(25)		Clearing Bsv
STATUS	VARCHAR2	(5)	Yes	Status
INTERCOMPANY_MODE	NUMBER	(1)		Intercompany Mode
DRIVING_DR_LE_ID	NUMBER	(15)		Driving Debit Legal Entity Identifier
DRIVING_CR_LE_ID	NUMBER	(15)		Driving Credit Legal Entity Identifier
DRIVING_DR_LE_CURR_CODE	VARCHAR2	(15)		Driving Dr Legal Entity Currency Code
DRIVING_CR_LE_CURR_CODE	VARCHAR2	(15)		Driving Cr Legal Entity Currency Code
CHART_OF_ACCOUNTS_ID	NUMBER	(15)		Chart Of Accounts Id
BAL_SEG_COLUMN_NAME	VARCHAR2	(25)		Balancing Segment

				Column Name
BAL_SEG_COLUMN_NUMBER	NUMBER	(2)		Bal Seg Column Number
INTERCOMPANY_COLUMN_NUMBER	NUMBER	(2)		Intercompany Column Number
LE_ID	NUMBER	(15)		Legal Entity Id
LE_COUNT	NUMBER	(15)		Legal Entity Count
UNMAPPED_BSV_LE_ID	NUMBER	(15)		Unmapped BSV Legal Entity Id
ERROR_CODE	VARCHAR2	(30)		Error Code

- The greyed out columns are populated and used internally by the balancing API

FUN_BAL_LINES_GT

Name	Datatype	Length	Mandatory	Comments
GROUP_ID	NUMBER	(15)	Yes	Group Id
BAL_SEG_VAL	VARCHAR2	(25)		Balancing Segment Value
ENTERED_AMT_DR	NUMBER			Entered Amount Debit
ENTERED_AMT_CR	NUMBER			Entered Amount Credit
ENTERED_CURRENCY_CODE	VARCHAR2	(15)		Entered Currency Code
EXCHANGE_DATE	DATE			Exchange Date
EXCHANGE_RATE	NUMBER			Exchange Rate
EXCHANGE_RATE_TYPE	VARCHAR2	(30)		Exchange Rate Type
ACCOUNTED_AMT_DR	NUMBER			Accounted Amount Debit
ACCOUNTED_AMT_CR	NUMBER			Accounted Amount Credit
LINE_REFERENCE	VARCHAR2	(25)		Line Reference. Not required
GENERATED	VARCHAR2	(1)	Yes	Indicates whether the line has been generated by balancing API. Value should be 'N'.
CCID	NUMBER	(15)		Code Combination Identifier

Result Tables

FUN_BAL_RESULTS_GT

Name	Datatype	Length	Mandatory	Comments
GROUP_ID	NUMBER	(15)		Group Id
BAL_SEG_VAL	VARCHAR2	(25)		Bal Seg Val
ENTERED_AMT_DR	NUMBER			Entered Amt Debit
ENTERED_AMT_CR	NUMBER			Entered Amt Credit
ENTERED_CURRENCY_CODE	VARCHAR2	(15)		Entered Currency Code
EXCHANGE_DATE	DATE			Exchange Date
EXCHANGE_RATE	NUMBER			Exchange Rate
EXCHANGE_RATE_TYPE	VARCHAR2	(30)		Exchange Rate Type
ACCOUNTED_AMT_DR	NUMBER			Accounted Amt Debit
ACCOUNTED_AMT_CR	NUMBER			Accounted Amt Credit
CCID	NUMBER	(15)		Ccid
BALANCING_TYPE	VARCHAR2	(1)		Balancing Type R indicates Intracompany Line, E indicates Intercompany Line
JGZZ_RECON_STATUS	VARCHAR2	(1)		GL Reconciliation column. Currently not used.
JGZZ_RECON_DATE	DATE			GL Reconciliation column. Currently not used.
JGZZ_RECON_ID	NUMBER	(15)		GL Reconciliation column. Currently not used.
JGZZ_RECON_REF	VARCHAR2	(240)		GL Reconciliation column. Currently not used.
JGZZ_RECON_CONTEXT	VARCHAR2	(30)		GL Reconciliation column. Currently not used.
DR_BSV	VARCHAR2	(25)		Debit Bsv
CR_BSV	VARCHAR2	(25)		Credit Bsv
ACCT_TYPE	VARCHAR2	(1)		Acct Type

TEMPLATE_ID	NUMBER	(15)		Template Id
LE_ID	NUMBER	(15)		Legal Entity Identifier

- The greyed out columns are not used by the GL Posting and SLA Accounting programs

FUN_BAL_ERRORS_GT

Name	Datatype	Length	Mandatory	Comments
GROUP_ID	NUMBER	(15)		Group Id
ERROR_CODE	VARCHAR2	(30)		Error Code
BAL_SEG_VAL	VARCHAR2	(25)		Bal Seg Val
DR_BSV	VARCHAR2	(25)		Debit Bsv
CR_BSV	VARCHAR2	(25)		Credit Bsv
CLEARING_BSV	VARCHAR2	(25)		Clearing Bsv
LINE_REFERENCE	VARCHAR2	(25)		Line Reference
FROM_LE_ID	NUMBER	(15)		From Legal Entity Identifier
TO_LE_ID	NUMBER	(15)		To Legal Entity Identifier
CCID	NUMBER	(15)		Code Combination Identifier
LE_ID	NUMBER	(15)		Legal Entity Identifier
CCID_CONCAT_DISPLAY	VARCHAR2	(800)		Concatenated Account
TEMPLATE_ID	NUMBER	(15)		Template Id
ACCT_TYPE	VARCHAR2	(1)		Account Type

APPENDIX 2

Intercompany Balancing

Error Codes:

GL Posting and SLA Accounting programs are aware of the following errors that the balancing API returns.

FUN_INTER_BSV_NOT_ASSIGNED
FUN_INTER_REC_NOT_ASSIGNED
FUN_INTER_REC_NO_DEFAULT
FUN_INTER_PAY_NOT_ASSIGNED
FUN_INTER_PAY_NO_DEFAULT
FUN_INTRA_RULE_NOT_ASSIGNED
FUN_INTRA_NO_CLEARING_BSV
FUN_INTRA_OVERRIDE_BSV_ERROR
FUN_INTRA_CLEAR_BSV_INVALID
FUN_INTER_REC_NOT_VALID
FUN_INTER_PAY_NOT_VALID
FUN_INTRA_CC_NOT_VALID
FUN_INTRA_CC_NOT_ACTIVE
FUN_INTRA_CC_NOT_CREATED
FUN_BAL_GET_CCID_ERROR