Pivot
Penny Rounding
Technical Specification

Version 1.2
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1. Overview

1.1   Description

Some governments are removing the penny (.01) tender from their currency. In order to accommodate this, Pivot must round local currency tenders to an amount not requiring this denomination when dispensing change or a refund. The design allows for the retirement of any denomination (ie retiring the nickel).

2. User Impacts

2.1   Change Due Rounding Process Flow

2.1.1 User Accepts Rounding
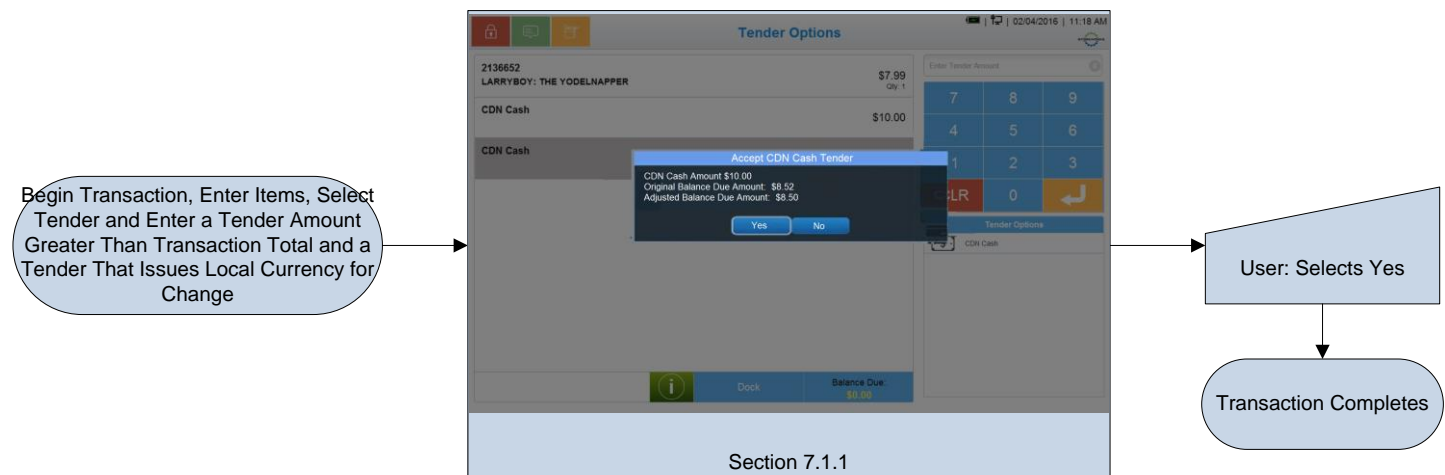
2.1.2 User Declines Rounding
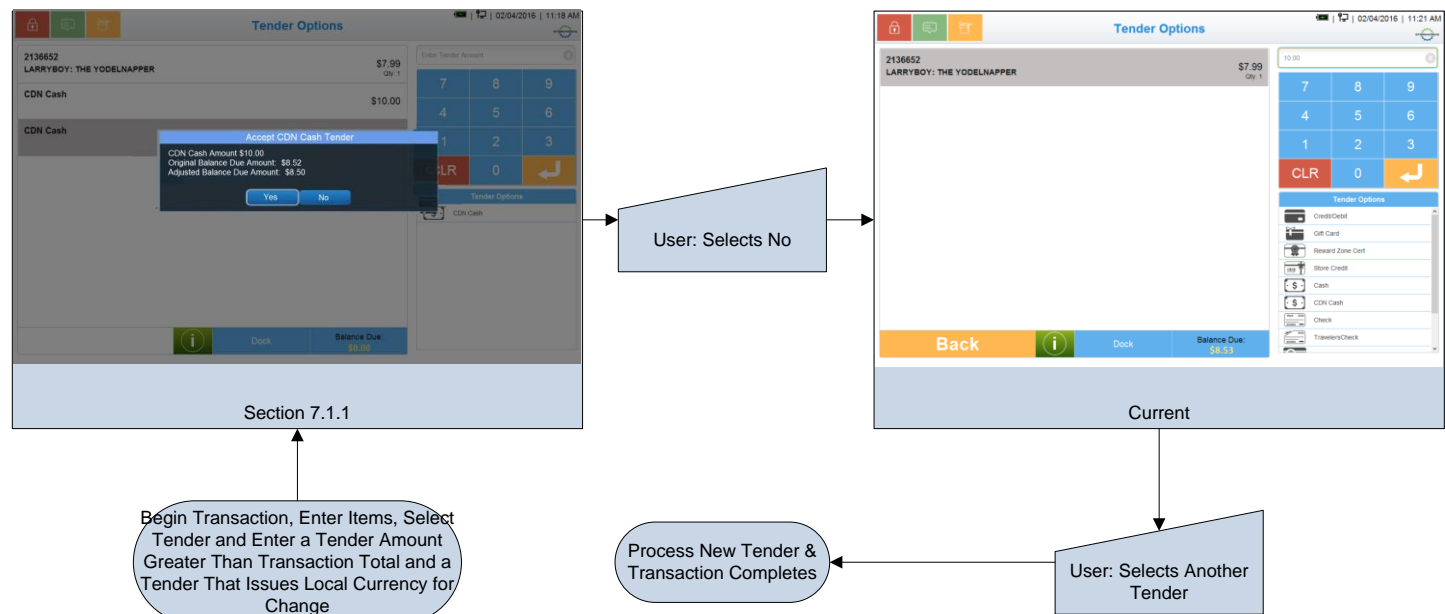
2.2   Refund Due Process Flow

2.2.1 User Accepts Rounding

Begin Return Transaction, Enter Items, Select Tender and Select Local Currency for Refund

Section 7.1.2

User: Selects Yes

Transaction Completes

2.2.2 User Declines Rounding

Section 7.1.2

User: Selects No

Current

Begin Return Transaction, Enter Items, Select Tender and Select Local Currency for Refund

User: Selects Another Tender

Process New Tender & Transaction Completes
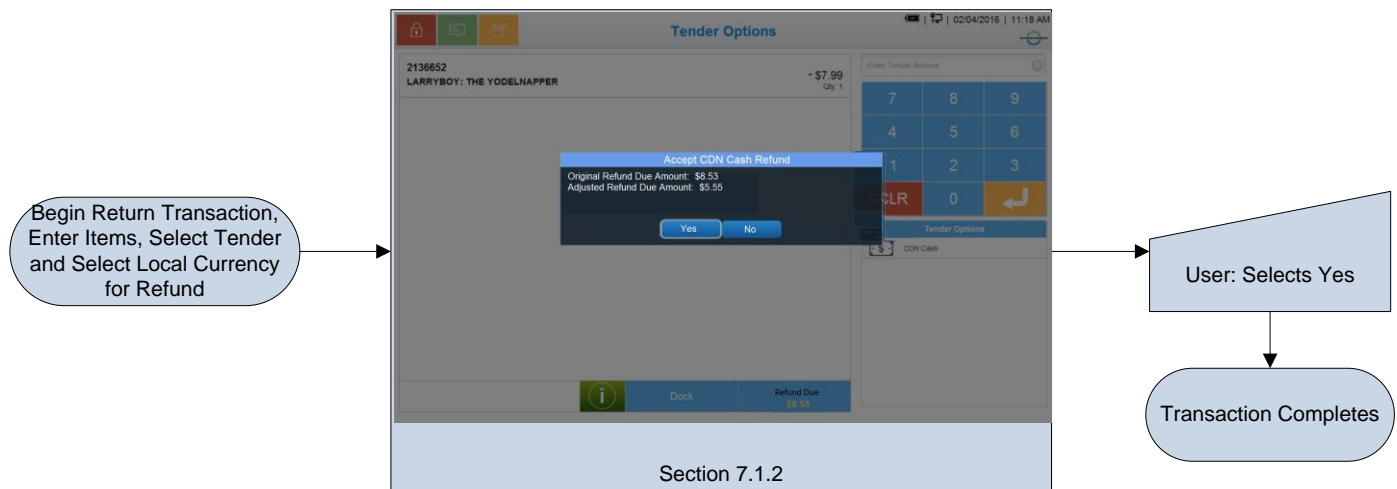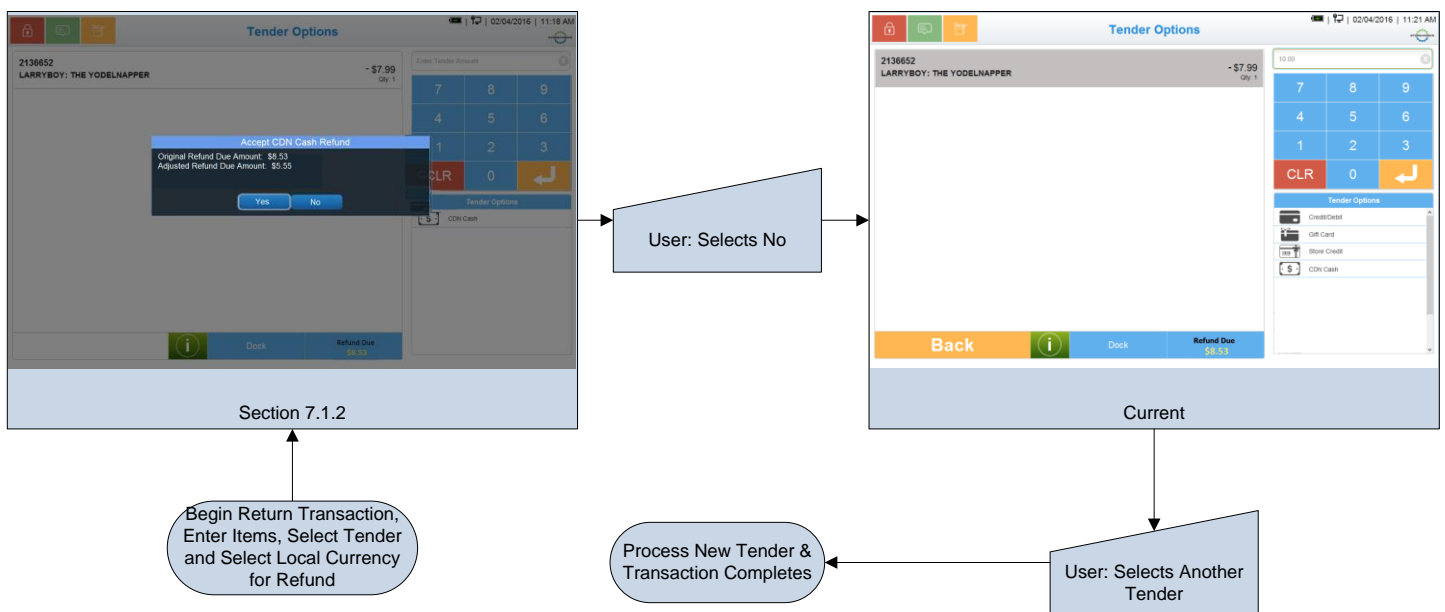
2.3   Cash Out Rounding Process Flow

Section 7.1.1
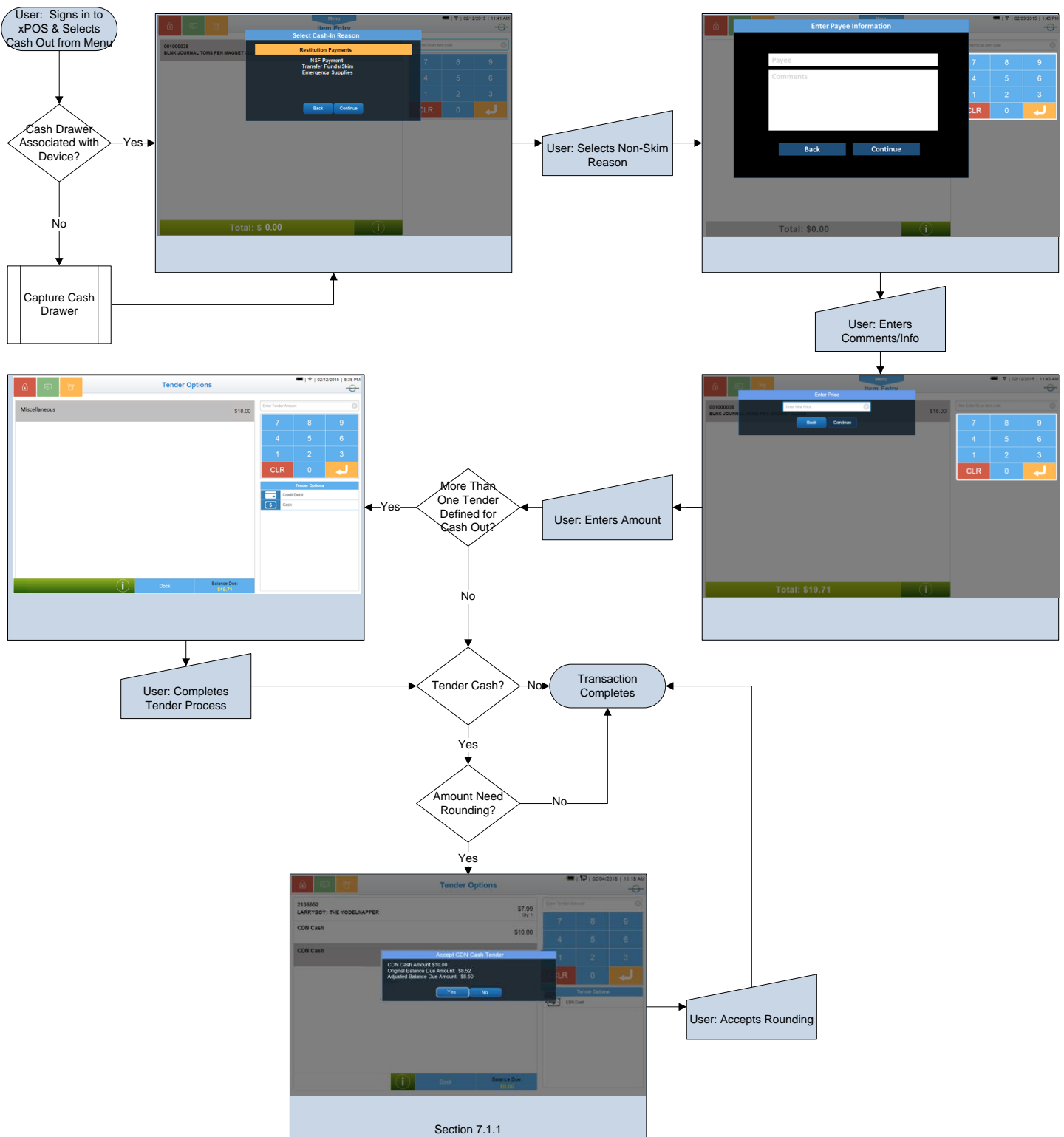
3. Use Case: Change Due Rounding

3.1   Use Case Flow

Figure 1: Change Due Rounding Flow

3.2   Preconditions

- User has signed on to system

- User entered items to purchase.

- User selected tender (and entered amount if not transaction total). **NOTE**: Additional tenders may have been added prior to this tender.

3.3   Main Flow

1. If Tender Rounding flag is not set (section 8), use case ends and tendering process continues with no rounding.
2. System evaluates transaction balance after tender amount applied to the transaction. **NOTE**: Tender not added, only amount applied for evaluation.
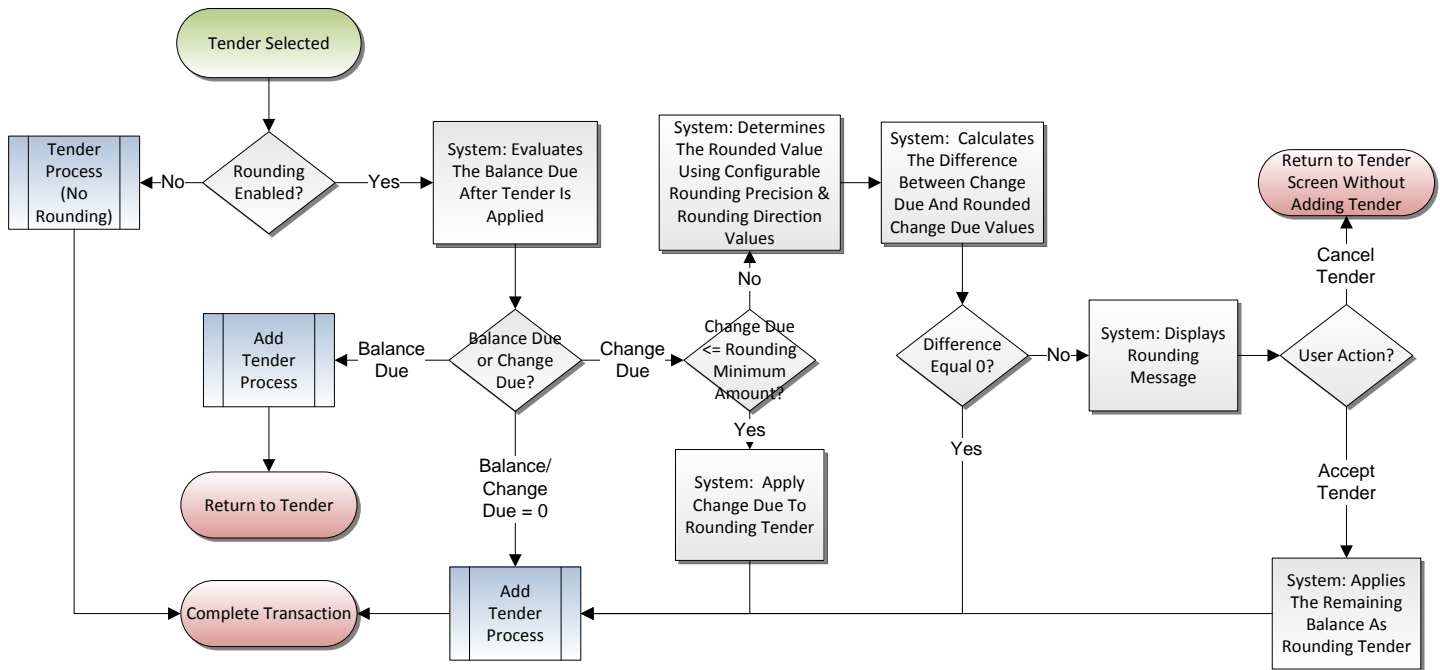3. If a balance due remains, system adds the tender, use case ends and system returns to the calling use case.
4. If transaction balance is $0, system adds the tender, use case ends and tendering process continues with no rounding.
5. System compares the change due to the rounding minimum parameter (section 8).
6. If change due is less than the rounding minimum parameter, system adds change due amount as the rounding tender type, use case ends and tendering process continues.
7. System determines the rounded value using configurable rounding precision and rounding direction values (section 8).
8. System compares the difference between the change due and rounded change due values.
9. If there is no difference, system adds the tender, use case ends and tendering process continues with no rounding.
10. If there is a difference, system displays Change Rounded Message (section 6.1.1).
11. If user selects No, system does not add tender and returns to tender screen.
12. If user selects Yes, system adds the tender for the rounded amount, adds the remainder as the rounding tender, use case ends and system returns to the calling use case.

3.4   Special Cases/Notes

1. Rounding rules not used for Cash In or Skim transactions.

2. If Cash Out defined tender is cash with rounding flag set, system processes the refund due the same as change due.

4. Use Case: Refund Due Rounding
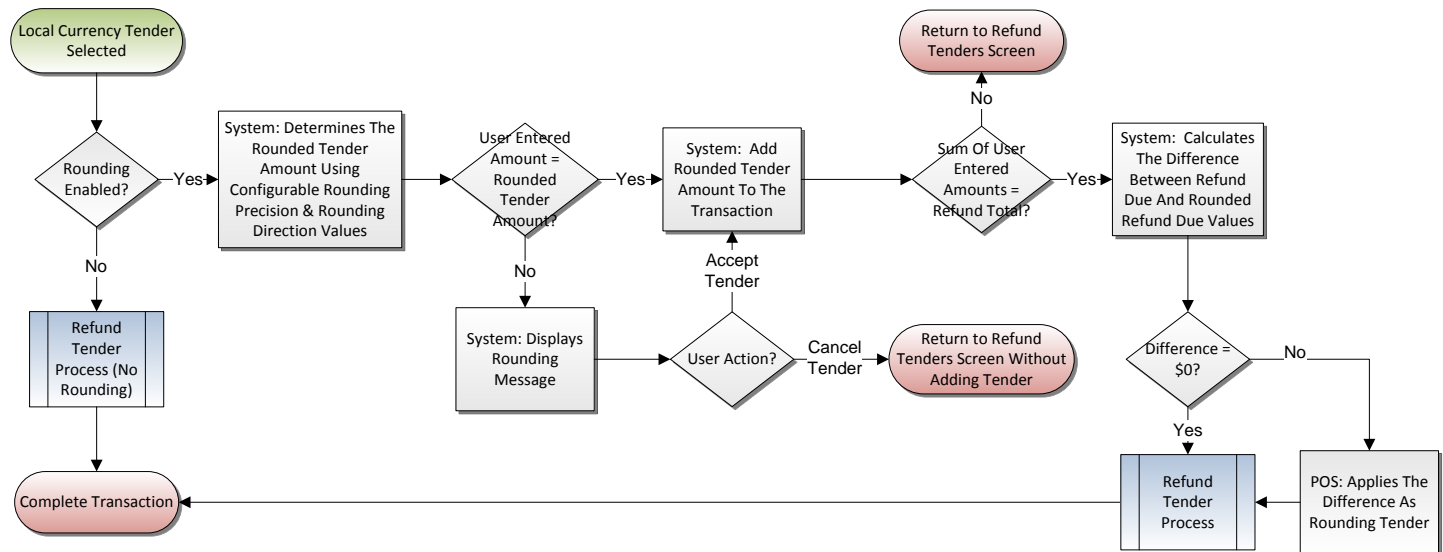
4.1   Use Case Flow

Figure 2: Refund Due Rounding Flow

4.2   Preconditions

- User has started a return transaction.

- User has returned items.

- User has selected tender and a tender.

4.3   Main Flow

1. If Tender Rounding flag is not set (section 8), use case ends and tendering process continues with no rounding.
2. System determines the rounded tender amount using the amount entered by the user and the configurable rounding precision and rounding direction values (section 8).
3. System evaluates the user entered amount with the refund due amount.
4. If values do not equal, system adds the rounded tender to the transaction using tender processes, use case ends and returns to tender screen.
5. System compares the difference between the refund due and rounded refund due values.
6. If there is no difference, system applies the tender, use case ends and tendering process continues with no rounding.
7. If there is a difference, system displays Refund Rounded Message (section 6.1.2).
8. If user selects No, system does not apply tender and returns to tender screen.
1. If user selects Yes, system applies the tender for the rounded amount, applies the remainder to the rounding tender use case ends and system returns to the calling use case.

5. Assumptions

1. .

6. Screen Layouts

6.1 Dialog Messages/Message Boxes

6.1.1 Change Rounded Message

Description	Displays when change due requires rounding.
Message	Accept CDN Cash Tender CDN Cash Amount: $xx Original Balance Due Amount: $xxxx Adjusted Balance Due Amount: $xxxx
Key prompt	• Yes – Completes dispensing change and returns to collect additional tender or transaction completes. • No – Return to tenders for user to select another tender.
Notes	Text is configurable. Yes has focus, such that an 'Enter' key would automatically select 'Yes'.

6.1.2 Refund Rounded Message

Description	Displays when refund due requires rounding.
Message	Accept CDN Cash Tender CDN Cash Amount: $xx Original Refund Due Amount: $xxxx Adjusted Refund Due Amount: $xxxx
Key prompt	• Yes – Completes dispensing refund and returns to refund additional tender or transaction completes. • No – Return to return tenders for user to select another tender.
Notes	Text is configurable. Yes has focus, such that an 'Enter' key would automatically select 'Yes'.

7. Receipts

If the rounding tender is not zero, then POS prints the rounding tender description and amount on the receipt. The rounding tender is printed above the cash change due or cash refund lines on the receipt.

7.1.1 Field Definitions

Name	Description	Notes
Rounding Tender	The description of the Rounding Tender to print on the receipt	The text is configurable and defined as any other tender.

7.2   Change Due – Sale Transaction

A Negative value for the rounding tender represents that it is in the store's favor. The customer in this situation received less change refund than expected.

A Positive value for the rounding tender represents that it is in the customers favor. The customer in this situation received more change than expected.

```
        Welcome to the POS
         Corporate Office
          (999) 999-9999
         POS LAB TESTING

          BAR CODE

Val # 1234-2432-2344-2542
0934  001  9620   08/29/11        15:31  G1X4

              SALE

10001000    SPEAKERS            29.50
     SPEAKERS

                 SUBTOTAL    29.50
                 12% TAX       3.54
                 _____
                 TOTAL       33.04

                 CDN CASH    40.00
                 CDN CASH    -0.01
         CHANGE CDN CASH      6.95

*************************************************
Configurable RECEIPT FOOTER from DB
```

```
        Welcome to the POS
         Corporate Office
          (999) 999-9999
         POS LAB TESTING

          BAR CODE

Val # 1234-2432-2344-2542
0934  001  9621   08/29/11        15:31  G1X4

              SALE

10001001    MOVIE               9.79
     MOVIE

                 SUBTOTAL     9.79
                 12% TAX       1.17
                 _____
                 TOTAL       10.96

                 CDN CASH    20.00
                 CDN CASH     0.01
         CHANGE CDN CASH      9.05

*************************************************
Configurable RECEIPT FOOTER from DB
```

Figure 3: Rounded Sale Transaction Receipt Example

7.3 Refund Due – Return/Exchange Transactions

A Positive value for the rounding tender represents that it is in the stores favor. The customer in this situation received less change or refund than expected.

A Negative value for the rounding tender represents that it is in the customers favor. The customer in this situation received more change or refund than expected.

```
        Welcome to the POS
          Corporate Office
           (999) 999-9999
          POS LAB TESTING

|||||||||| BAR CODE ||||||||||

Val # 1234-2432-2344-2542
0934  001  9622   08/29/11          15:31  G1X4

             RETURN
Original Tran 0934 001 9620 08/29/11

10001000    SPEAKERS              - 29.50
     SPEAKERS

                    SUBTOTAL    - 29.50
                    12% TAX      - 3.54
                    _____

                    TOTAL       - 33.04

                    CDN CASH     -0.01
                    CDN CASH     33.05


*************************************************************
Configurable RECEIPT FOOTER from DB
```

```
        Welcome to the POS
          Corporate Office
           (999) 999-9999
          POS LAB TESTING

|||||||||| BAR CODE ||||||||||

Val # 1234-2432-2344-2542
0934  001  9623   08/29/11          15:31  G1X4

             RETURN
Original Tran 0934 001 9621 08/29/11

10001001    MOVIE                   -9.79
     MOVIE

                    SUBTOTAL     -9.79
                    12% TAX      -1.17
                    _____

                    TOTAL       -10.96

                    CDN CASH      0.01
                    CDN CASH     10.95


*************************************************************
Configurable RECEIPT FOOTER from DB
```

Figure 4: Refund Receipt Example

8. Configurable Settings

Parameter Mnemonic	Description	Valid Values	Configurable By
Enable Tender Rounding	Flag to Turn on/off Tender Rounding Functionality	On/Off	Tender
Change Due Rounding Precision	Values to round Change Due	The change value to round. Ex .01	Tender
Change Due Rounding Direction	Direction to round the values defined to round Change Due.	The value to round Precision to. Ex. .05	Tender
Balance Due Rounding Precision	Values to round Balance Due.	The change value to round. Ex .01	Tender
Balance Due Rounding Direction	Direction to round the values defined to round Balance Due.	The value to round Precision to. Ex. .05	Tender

9. Logging

Data Element	Description	Destination	Definition
Rounding Tender	Then tender added to the transaction for the rounding amount	• Electronic Journal • POSLog	

NOTE: Electronic Journal and POSLog Logging defined in respective documentation and remains the same as ePOS.

10. Out Of Scope

- *This Specification covers the changes needed to implement the Penny Rounding Feature.*

11. Revision History

11.1 Reviews

Date	Iteration	Result
2/10/2016	V1.0 – Best Buy Review	Updates in version 1.1

11.2 Revision History

Reviser	Revision	Date	Version
Amy Byers	Initial document	2/8/2016	1.0

Amy Byers	– Section 3.2: Added clarification that selected tender may not be the first tender entered, therefore selected tender may be the last tender and is rounded accordingly.
	– Section 3.3: Clarified that applying the tender is not adding the tender and corrected text for when tender is added.
	– Section 3.4:
	  o Removed that tender amount must be entered for cash as this is a configurable parameter.
	  o Added rounding rules not used for Cash In/Cash Out or Skim Transactions.
	– Sections 6.1.1 & 6.1.2: Clarified that Yes key has focus.
	– Section 8:
	  o Defined rounding Precision and Direction are defined by tender type.
	  o Defined separate rounding Precision and Direction for Change Due and Balance Due.
	  o Added examples of data.
	– Section 9: Added Logging section and noted that actual definitions in different documents.
		3/21/2016	1.1

Amy Byers	– Section 2: Added updated screen shot of Rounded messages. – Section 3.2: Clarified that the mount may be entered by user. – Section 3.4: Removed that Cash Out not following rounding rules and added that it follows change rounding rules. – Section 4.1: Moved rounding prompt to after amount balance check. – Section 6.1.1 & 6.1.2: Updated message text to match ePOS. – Section 8: Added column to define level of configuration. – Section 9: Added note that logging remains the same as ePOS.	4/21/2016	1.2

12. Appendix A: Glossary

Term	Definition