



Solving the Spare Parts Business Process

with a Custom APEX Solution that integrates with EBS



Solving Complex Business and Technology Problems With Experience and Knowledge

About AXIA Consulting

- ▲ Founded in 2005
- ▲ Approximately 100 Senior Consultants, averaging 20 years of industry experience
- ▲ 100% Employee Owned

Core Values....

- Be Vested
- Be Authentic
- Be There
- Be Approachable
- Be Honest

Committed To Excellence

Because of our commitment to excellence, many of our client relationships start with a project and turn into lasting partnerships.

Local & Global

Delivering results for clients in more than 54 countries over six continents.



AXIA Consulting helps clients identify and solve complex problems with teams of experts averaging over 20 years of experience. AXIA is different than other integrators because we do not “leverage” a few highly experienced consultants with less experienced resources. AXIA staffs projects with seasoned and experienced consultants.

AXIA Oracle Service Offerings



Matt Hauser

- Technical PM / Senior Business Analyst / Development Lead / Employee Owner
- 13 years of Consulting Experience
- 6 years in Industry
- Extensive EBS Experience
 - Inventory
 - BOM
 - Purchasing
 - iStore
 - PIM
 - iSupplier
 - Order Management

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- Understand the business problem and drivers for a new solution
 - Intelligrated will be used as the example
- Understand how Oracle's APEX product can be used to build custom solutions
- Understanding the Business Requirements to perform the task
- To model the solution approach in Oracle APEX
- To model out of the box functionality within Oracle APEX
- Identifying the Benefits of the new solution



Intelligrated®

- Leading North American-owned, single-point provider of automated material handling solutions with operations in multiple countries
- Designs, manufactures and installs complete material handling automation solutions, including: line sortation systems, loop sortation systems, conveyor systems, and palletizers
- Segment of the business is spare parts for the full systems that they design and manufacture
 - Spare parts can be designated as a standard spare part or critical spare part
 - A list of spare parts can be requested by the customer throughout the lifecycle of a project and after the project has concluded, including at the time of a quote, or years after the solution was installed

Problem:

- The old solution for creating Spare Parts lists utilized a legacy .net application which was understood by a very limited number of IT and business resources
- Business Processes were very cumbersome and the IT solution was not utilizing strategic software. It relied on:
 - Importing data from Oracle
 - vlookups of data into Customer Facing Reports
 - Manual manipulation of data into Customer Facing Reports



Solution:

- The new solution needed to be as good or better than the legacy solution
- The legacy solution had some functionality that would be difficult to replicate in standard Oracle Forms, such as pivot table analysis
- Oracle APEX was chosen as the solution because of its ease of use for development activities and its out of the box functionality



Ability Requirements:

- Change Spare Flag and Spare Type designations
- Exclude items from a Recommended Spare Parts List (RSPL)
- Create multiple versions of the same RSPL based on the current stage of the lifecycle (As Proposed vs. As Installed)
- Edit the BOMs and Sales Order lines of what was shipped
- Pull in Customer Specific Pricing
- Perform Slicing and Dicing of data on the fly
- Import data from outside systems



In order to build a new RSPL a Project or Sales Order is used as the starting point.

In order to begin the user can search by:

- Created By
- Customer
- Project Number
- RSPL Number
- Sales Order
- Spare Product Type



The screenshot shows the 'Intelligrated RSPL Workbench' interface. At the top, there is a navigation bar with tabs: Search, Details, Parts List, Where Used By Part No, Where Used Part By EquipNo, Import, Revisions, Reports, and Non-Spare Review. Below this is a 'Specific Search' section with a search bar containing 'Project Number' and 'M-14-00271'. To the right of the search bar are buttons: Go, Clear Search, Delete RSPL, Create New RSPL, and Add to an RSPL. Below the search bar is a table with the following data:

	RSPL Number	Customer	RSPL Type	Project Number
	28	Amazon.com	As Installed	M-14-00271

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Different sections utilized to provide different functionality on the same screen

Intelligated RSPL Workbench Home | Logout

Search | Details | **Parts List** | Where Used By Part No | Where Used Part By EquipNo | Import | Revisions | Reports | Non-Spare Review

Parts List | Determinations | Recommendations

1. Header Information:

RSPL Number : 256
 RSPL Type : As Engineered
 Project No. : Sales Order Only
 Customer : Conveyco Technologies Inc
 Customer Address :
 PBE Status :
 RSPL Status : In Progress
 Copy RSPL | Gen Pricing | Push to PBE | Delete from PBE | RSPL Report | Toggle RSPL Status

2. Change Header Information:

Select Customer :
 Select Customer Address :
 Enter New Project Number :
 Save

3. Update Values for Multiple rows:

Spare Flag :
 Spare Type :
 Spare Product Type :
 Quantity Recommended :
 Update Multiple rows | Add To Non-Spare Review

4. Main Report – Change individual rows:

Add | Update | Delete | Cancel | Refresh Cross References | Check Electrical Panels | Reset Pagination

Q- Go Actions

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	Source Product Type	Imported	Original Part Number	Part Number	Has BOM	Replacement Reason	Substitute Item Flag	Substitute Item	Cross Reference	Item Category (ICC)	Item Description	UOM	Qty Used	Qty Recommended
	Intelligated Spares	-	34002220	34002220	-	N	-	-	-	ROLLERS	ROL GCMAB 22.000EF	Ex	1371	
	Intelligated Spares	-	51021301	51021301	-	Y			-	RLR_OHVR_DRV_BK_R	S10 PAD DRIVER W/WEAR PAD	PI	153.39	13
	Intelligated Spares	-	34002400	34002400	-	N	-	-	-	Tubing	TUBING PUR .25IN OD .125IN ID, BLK .125IN ISA	PI	139.53	23
	Intelligated Spares	-	51001799	51001799	-	N	-	-	-	RLR_OHVR_CHAIN_GLUZ	S10 EXTRUDED CHAIN TRACK UHMW	PI	530.12	
	Intelligated Spares	-	340061160	340061160	-	N	-	-	-	ROLLERS	ROL GCMAB 16.000EF AN7 82006	Ex	482	
	Intelligated Spares	-	0155267	0155267	-	N	-	-	-	Wheels	WHEEL SKATEHHL SOLB U/AD, OILED	Ex	412	
	Intelligated Spares	-	47034000	47034000	-	N	-	-	-	RLR_OHVR_PSCR_SHEA	S10 VB PRESSURE SHV ADJUSTER ASSY 2.50" TWO FLANGE	Ex	354	


1. Header Information

2. Change Header Information

3. Update Values for Multiple rows

4. Main Report – Change individual rows

The Details Tab shows all the sales order lines, and explodes their BOMs, so the user can edit an individual part within a sales order line's BOM





RSPL Workbench

[Search](#)
[Details](#)
[Parts List](#)
[Where Used By Part No](#)
[Where Used Part By EquipNo](#)
[Import](#)
[Revisions](#)
[Reports](#)
[Non-Spare Review](#)

RSPL Number : 156
RSPL Type : As Engineered
Project No. : Sales Order Only
Customer : Conveyco Technologies Inc

Sales Order : %
Old Equipment Number : %
New Equipment Number :

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Link	Sales Number	Sales Order Line Number	Part Number	Item Catalog Category (ICC)	Description	Quantity Used
	1234	1.1	496316	MAPICS	ROLR G196GH 15.000 FY-N1	1
	12345	1.1	170A346	Nuts	NUT, T-NUT, M6X1.00 THRD SZ, RH, 1020, STL, ZP	20
	2007038	1.1.116.0	47006700-3644848	RB IDLER	.810 VB END IDL ASSY.16"BF.LH BELT.G196AB.GRAY	1

Once you drill into an individual line, you can change the equipment number, the component number and the quantity

Intelligrated RSPL Workbench

Search **Details** Parts List Where Used By Part No Where Used Part By EquipNo Import Revisions Reports Non-Spare Review

Details

RSPL Number : 156
Project Number : Sales Order Only
Sales Order No. : 12345
Part Number : 170A346

Old Equipment Number : %
New Equipment Number :
Sales Order Number : %
Sales Order Line Number : %
Update Equipment Number

Go Back Update Delete

Q Go Actions

Sales Order	Sales Order Line Number	Part Number	Parent Number	Item Catalog Category (ICC)	Description	Quantity Used	Old Equipment Number	New Equipment Number
12345	1.1	170A346		Nuts	NUT, T-NUT, M6X1.00 THRD SZ, RH, 1020, STL, ZP	20	Loose Parts	Loose Parts

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Go Back Update Delete

- All changes cascade to the other tabs

The Where Used tabs show all the parts that are used on an RSPL, by equipment number

Intelligrated Home | Logout |

Search | Details | Parts List | Where Used By Part No | **Where Used Part By EquipNo** | Import

Where Used Part By EquipNo |

RSPL Number : 1678
RSPL Type : Preliminary
Project No. : M-16-00001
Customer : Amazon.com

Part By Equipment No. - Summary Report

Q ▾ Go Actions ▾ **Apply Changes** **Change Equipment Number**

Equipment Number	Old Component Number	New Component Number	Item Description	Quantity	Item Catalog Category (ICC)	Spare Flag	Spare Type	Item Type	UOM
101	00000114	<input type="text" value="00000114"/>	RIVER GRAY (RAL7035) SW# HAS9-60004	10	PAINT_ITEMS	N	-	SI	Ea
101	80182500	<input type="text" value="80182500"/>	NETTING SUPPORT BRACE	47	PAINTED PARTS	-	-	FG	Ea
101	80182302	<input type="text" value="80182302"/>	NETTING CROSSBRACE BOTH SIDES 22BF	19	PAINTED PARTS	-	-	FG	Ea
101	70118200M	<input type="text" value="70118200M"/>	NETTING SUPPORT UPPER ANGLE	38	PAINTED PARTS	-	-	FG	Ea
101	4-11072-3491052	<input type="text" value="4-11072-3491052"/>	.WLD MNT HD SUPT BOOT.34.5"LG.SAFETY YELLOW	8	PAINTED PARTS	-	-	FGC	Ea

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- On this screen you can change a component number or an equipment number
- All changes cascade to the other tabs

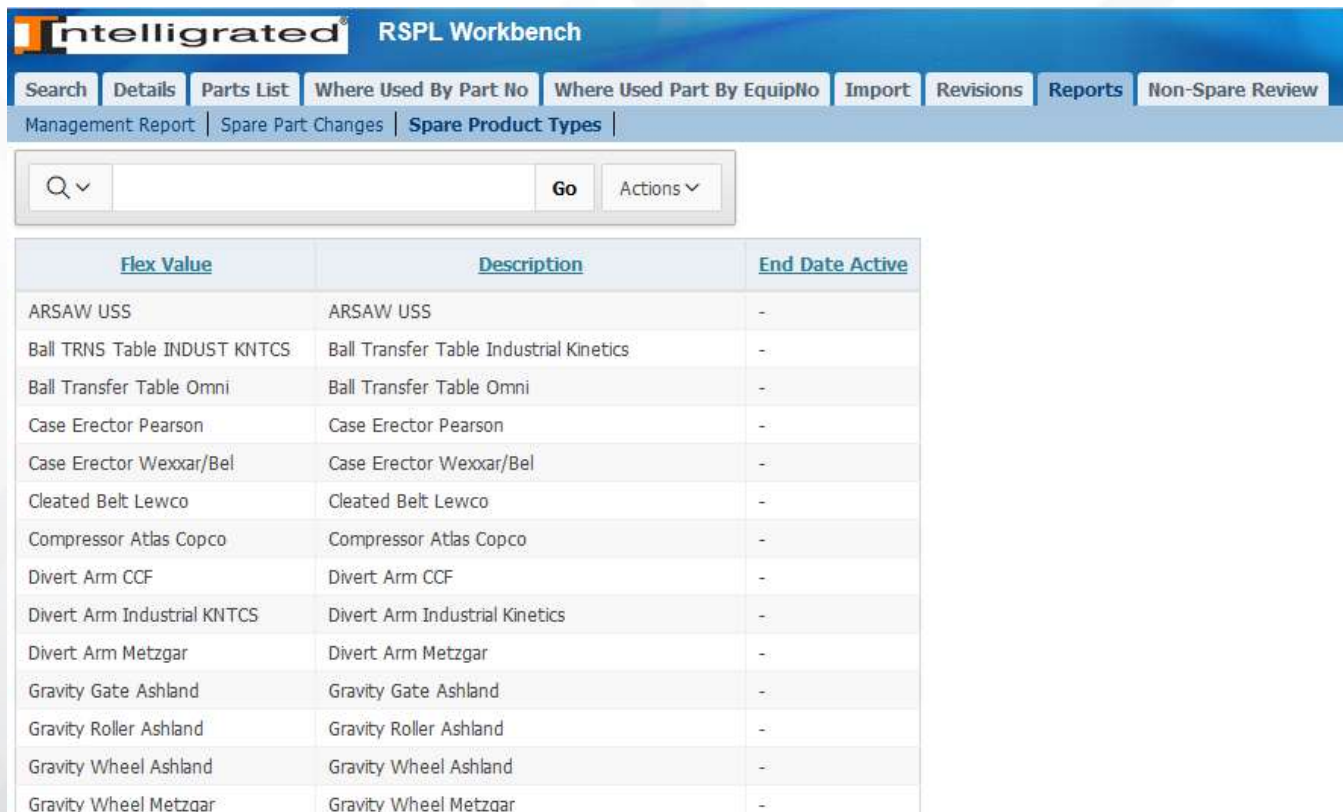
The Import Tab allows the user to import data that may not exist on Sales Orders within Oracle

The screenshot shows the 'Intelligrated RSPL Workbench' interface. The 'Import' tab is selected and highlighted with a red box. Below the tab, a red-bordered box contains the following fields and controls:

- *Choose File (csv): Choose File (No file chosen)
- *RSPL Type: [Dropdown menu]
- *Customer: [Dropdown menu]
- *Customer Address: [Dropdown menu]
- RSPL Number: [Dropdown menu]
- (Leave blank if creating a new RSPL)
- Upload: [Button]

- The user can add it to an existing RSPL or create a brand new RSPL
- If the part numbers on the import file are not within Oracle, the user receives an exception report so the items can be inducted

There are 3 main reports used by the RSPL team to review data:



The screenshot shows the 'Intelligrated RSPL Workbench' interface. The 'Reports' tab is selected in the top navigation bar. Below the navigation bar, there is a search bar with a magnifying glass icon, a 'Go' button, and an 'Actions' dropdown menu. The main content area displays a table with three columns: 'Flex Value', 'Description', and 'End Date Active'. The table lists various equipment items and their status.

Flex Value	Description	End Date Active
ARSAW USS	ARSAW USS	-
Ball TRNS Table INDUST KNTCS	Ball Transfer Table Industrial Kinetics	-
Ball Transfer Table Omni	Ball Transfer Table Omni	-
Case Erector Pearson	Case Erector Pearson	-
Case Erector Wexxar/Bel	Case Erector Wexxar/Bel	-
Cleated Belt Lewco	Cleated Belt Lewco	-
Compressor Atlas Copco	Compressor Atlas Copco	-
Divert Arm CCF	Divert Arm CCF	-
Divert Arm Industrial KNTCS	Divert Arm Industrial Kinetics	-
Divert Arm Metzgar	Divert Arm Metzgar	-
Gravity Gate Ashland	Gravity Gate Ashland	-
Gravity Roller Ashland	Gravity Roller Ashland	-
Gravity Wheel Ashland	Gravity Wheel Ashland	-
Gravity Wheel Metzgar	Gravity Wheel Metzgar	-

- All 3 are straight data dumps, but utilizing APEX out of the box functionality, they can be personalized by the end user to see the data they want to see

A default view is created during development, but it can be changed using the standard Actions button and saved as a personal view

The screenshot displays an APEX report interface. At the top, there is a search bar with a magnifying glass icon and a 'Go' button. Below the search bar, the text '1 - 8 of 8' indicates the current page and total rows. The main area contains a table with columns: 'Spare Product Type', 'Imported', and 'Orig'. The 'Spare Product Type' column contains dropdown menus with the value 'Intelligrated Spares'. The 'Imported' column contains hyphens. The 'Orig' column contains numerical values: 1107, 6110, 0202, and 0203. On the right side of the table, there is an 'Actions' button. A mouse cursor is clicking on the 'Actions' button, which has opened a dropdown menu. The menu options are: 'Select Columns' (highlighted in blue), 'Filter', 'Rows Per Page', 'Format', 'Flashback', 'Save Report', 'Reset', 'Help', and 'Download'.

	<u>Spare Product Type</u>	<u>Imported</u>	<u>Orig</u>
<input type="checkbox"/>	Intelligrated Spares	-	1107
<input type="checkbox"/>	Intelligrated Spares	-	6110
<input type="checkbox"/>	Intelligrated Spares	-	0202
<input type="checkbox"/>	Intelligrated Spares	-	0203

Select Columns allows the ability to add and remove columns from the list of columns displayed

Select Columns

Do Not Display

- Customer Part Number
- Part Number Unique

Display in Report

- ☐ ☐
- Spare Product Type
- Imported
- Original Part Number
- Part Number
- Has BOM
- Replacement Reason
- Substitute Item Flag
- Substitute Item

Cancel Apply

- Many columns are rarely used, but may be needed in particular use cases so this allows them to change the view that they are working in

Control Breaks, Totals & Highlighting Example

Initial Data Screen

Intelligrated® RSPL Workbench

Search | Details | Parts List | Where Used By Part No | Where Used Part By EquipNo | Import | Revisions | Rep

Management Report | Spare Part Changes | Spare Product Types |

Q v Go 1. Primary Report Actions v

RSPL Number	RSPL Type	RSPL Month	Project Number	Creation Date	RSPL Status
5	As Engineered	NOV-2016	Sales Order Only	30-NOV-16	-
25	Partial	DEC-2016	F-14-02586	02-DEC-16	-
26	As Proposed	DEC-2016	Import Only	02-DEC-16	In Progress
28	As Installed	DEC-2016	M-14-00271	02-DEC-16	In Progress
28	As Installed	DEC-2016	S-15-23284	02-DEC-16	In Progress
28	As Installed	DEC-2016	Sales Order Only	02-DEC-16	In Progress
36	As Proposed	DEC-2016	A-15-13037	02-DEC-16	In Progress
42	As Engineered	DEC-2016	S-15-23284	05-DEC-16	-
43	Partial	DEC-2016	M-14-09503	05-DEC-16	-
47	Partial	DEC-2016	A-15-13037	06-DEC-16	-
48	As Proposed	DEC-2016	Sales Order Only	06-DEC-16	-
61	As Engineered	DEC-2016	Sales Order Only	09-DEC-16	In Progress
62	As Engineered	DEC-2016	A-14-13402	12-DEC-16	-
63	As Engineered	DEC-2016	Sales Order Only	12-DEC-16	In Progress
83	As Proposed	DEC-2016	S-16-23129	15-DEC-16	Complete
85	As Engineered	DEC-2016	F-15-05039	15-DEC-16	In Progress
86	Partial	DEC-2016	S-16-23129	15-DEC-16	-
87	Partial	DEC-2016	D-14-22871	15-DEC-16	-
87	Partial	DEC-2016	Sales Order Only	15-DEC-16	-
300	As Engineered	JAN-2017	Import Only	16-JAN-17	-
107	Partial	DEC-2016	A-14-13402	16-DEC-16	In Progress

Control Breaks, Highlighting & Totals

- Added a control break for the Created By
- Added highlighting for Jan-2017
- Add totals



Created By : Minnie Mouse					
RSPL Number	RSPL Type	RSPL Month	Project Number	Creation Date	RSPL Status
20344	As Proposed	JAN-2017	IQ-16-42023B	18-JAN-17	In Progress
20356	Partial	JAN-2017	S-15-23830	19-JAN-17	In Progress
48497	As Engineered	FEB-2017	F-13-03706	14-FEB-17	In Progress
48492	Partial	FEB-2017	M-13-00253	14-FEB-17	In Progress
48472	Partial	FEB-2017	Sales Order Only	08-FEB-17	In Progress
48471	Partial	FEB-2017	M-14-00520	07-FEB-17	In Progress
48470	Partial	FEB-2017	F-15-02053	03-FEB-17	In Progress
Count:7					
Created By : Mickey Mouse					
RSPL Number	RSPL Type	RSPL Month	Project Number	Creation Date	RSPL Status
45222	Preliminary	FEB-2017	EK246	01-FEB-17	In Progress
20466	Preliminary	JAN-2017	BD132	31-JAN-17	In Progress
45213	Preliminary	FEB-2017	A-13-12262	01-FEB-17	In Progress
Count:3					
Created By : Donald Duck					
RSPL Number	RSPL Type	RSPL Month	Project Number	Creation Date	RSPL Status
20461	As Proposed	JAN-2017	M-14-00298	30-JAN-17	In Progress
Count:1					
Created By : Daisy Duck					
RSPL Number	RSPL Type	RSPL Month	Project Number	Creation Date	RSPL Status
45303	Preliminary	FEB-2017	KH93	01-FEB-17	In Progress
45248	Preliminary	FEB-2017	F2203	01-FEB-17	In Progress
Count:2					

Control Break:

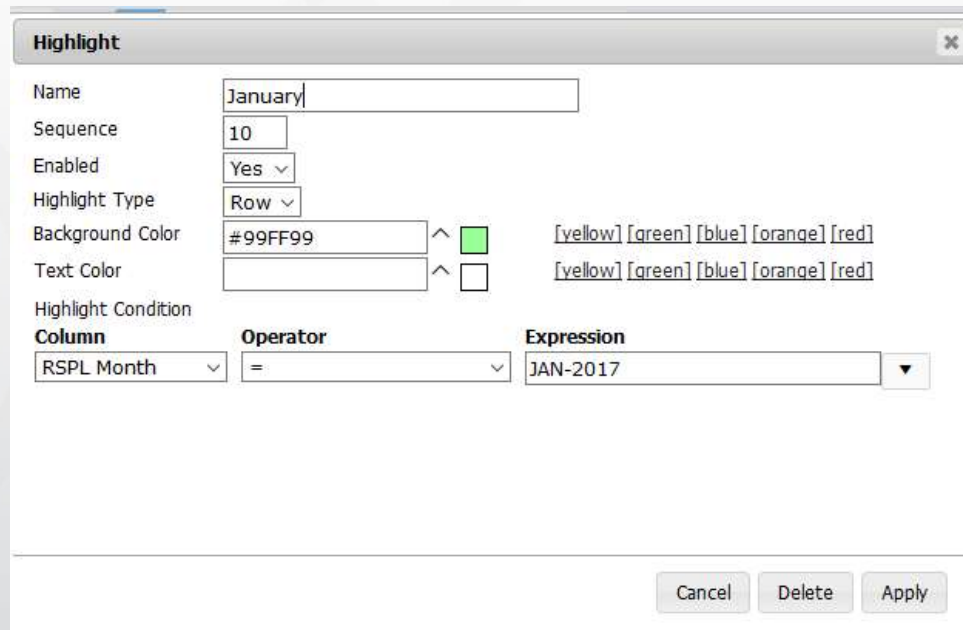
- Actions > Format > Control Break

Totals:

- Actions > Format > Aggregate

Highlighting:

- Actions > Format > Highlight



Highlight

Name: January

Sequence: 10

Enabled: Yes

Highlight Type: Row

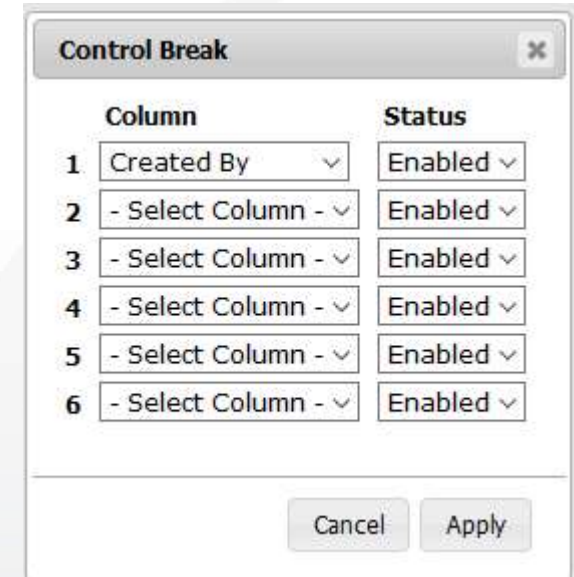
Background Color: #99FF99

Text Color:

Highlight Condition

Column	Operator	Expression
RSPL Month	=	JAN-2017

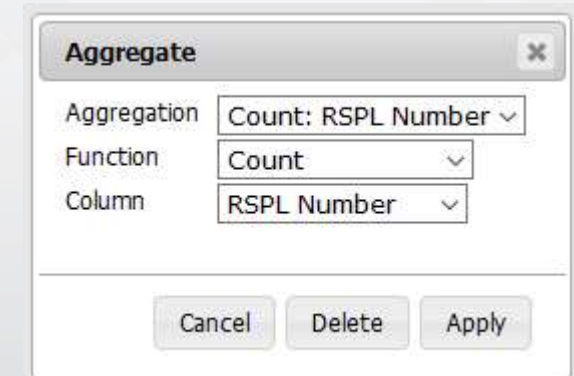
Buttons: Cancel, Delete, Apply



Control Break

Column	Status
1 Created By	Enabled
2 - Select Column -	Enabled
3 - Select Column -	Enabled
4 - Select Column -	Enabled
5 - Select Column -	Enabled
6 - Select Column -	Enabled

Buttons: Cancel, Apply



Aggregate

Aggregation: Count: RSPL Number

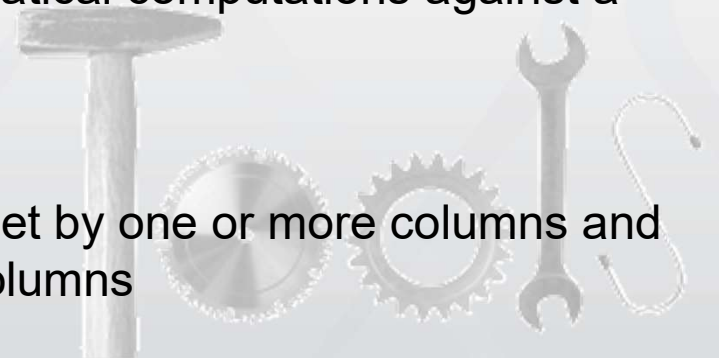
Function: Count

Column: RSPL Number

Buttons: Cancel, Delete, Apply

Format has a lot of powerful tools that can be used to help slice and dice data for the users:

- **Sort:** Changes the columns to sort and determines whether to sort in ascending or descending order
- **Control Break:** Creates a break group on one or several columns. This pulls the columns out of the interactive report and displays them as a master record
- **Highlight:** Defines a filter that highlights the rows that meet the filter criteria
- **Compute:** Enables users to add computed columns to a report
- **Aggregate:** Enables users to perform mathematical computations against a column
- **Chart:** Displays the report data as a chart
- **Group By:** Enables users to group the result set by one or more columns and perform mathematical computations against columns



Tool resides in Oracle, item data is real-time:

- Data & Electrical BOMs are available immediately, eliminating nightly feed wait for the legacy system
- Spare designation is real-time and resides in the Oracle Item Master, Oracle is now the record of truth for spare information
- Pricing can now be generated directly in the Spare List, without the need to use an uploader
- Any process that could take a long time is run as a concurrent request in the background so the user can continue to work
 - In the Legacy Tool if you are running a long running request you can not continue to work, sometimes you can wait over an hour.
 - Creating a new RSPL
 - Creating a new RSPL Report
 - Generating Pricing
 - Swapping out Cross References

Better Definition:

- Ability to better define RSPLs to stages of the lifecycle process
 - As Proposed
 - Partial
 - As Engineered
 - As Installed
 - As Exists
- Spare Type gives the ability to add additional types of spares in the future
- Normalization of Spare Product Types presented internally and externally, through standard drop down menus
- Some Spare Product Types are determined by the Item's Classification, capitalizing on the PDS project
 - Intelligrated Spares
 - Electrical Spares
 - Scanner – Cognex
 - Scanner – Sick

Data Automation: Manual Data Manipulation has been automated

- The finalized report from Legacy System had to have manual data manipulation performed.
 - Substitute Items had to be manually swapped out (ex. Driver Pad vs Driver Pad Roll)
 - Items listed on multiple sheets had to be combined to remove duplication
 - Old report showed all conveyors in the “Where Used by Conveyor” column, at times over 175 conveyors in 1 cell, which was un-readable
- New Process:
 - Substitute Items are now available to be swapped out in the workbench
 - Items are forced to be on 1 sheet in the new workbench
 - Where Used tab now has the asset number on each line
 - The “Where Used by Conveyor” column has been changed to be “Number of Assets Used In”, which shows a count instead of listing out every conveyor in the cell

