



Petrofac 

Plant Asset Management

Spare Parts Development

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- Founded in 1981 in Tyler, TX
- A leading international provider of facilities solutions to Oil & Gas production & processing industry
- 18,000 Personnel in 29 countries
- 2013 Revenue: \$6.3B
- Backlog: \$15B
- 2 Divisions
 - ECOM: Engineering, Construction, Ops & Maintenance
 - Onshore Engineering & Construction
 - Offshore Projects & Operations
 - Offshore Capital Projects
 - Engineering & Consulting Services
 - IES: Integrated Energy Services
 - Developments
 - Production Solutions
 - Training Services

A Leading Challenge: Free Text WO Materials

- Planners have trouble finding Material Items
- Planners “free text” Materials on PRs and/or request new Item Masters be created
- “Item Research” function researches Free Text Materials
- Engineering review required to mitigate risks
- Takes longer to create/approve Purchase Orders
- Received Items often in error

The Leading Solution: SPAREPART Records

- Item Masters associated with Assets are referred to as “Spare Parts”
- SPAREPART Table correlates Items & Assets; it contains 4 critical fields:
 - Asset There is a one-to-many relationship
 - Item Number between Assets and Items
 - Quantity Quantity of Item on the Asset
 - Remarks Can be used to identify Critical SPAREPARTs
- SPAREPART records can be created from:
 - Asset records
 - Item Master records
 - Automatically via SPAREPARTAUTOADD when an Item is issued to an Asset on a Work Order

Primary Benefits of SPAREPART Records

- **Material Items appear in “Pick List” on Work Plans & Job Plans**
- **Eliminates Item Research effort**
- **Improves PR-to-PO Performance**
- **Reduces purchasing errors**
- **Expedites creation of Work Plans and Work Orders**
- **Improves Maintenance Support and Production**

The Cost of Free Text

- **Business Process**
- **Cost Model**
- **Average cost of Free Text: \$2,656/Item**
- **716 Free Text WO Line Items/month = \$1.9M/month**

SPAREPART Challenges

- **Time was of the essence**
- **Document research**
- **Data capture**
- **RSPL Line Item Matching to Item Masters**

Our Approach: Identical Assets

- **Group identical Assets**
- **Utilize custom software**
- **Leverage existing SPAREPART records - *programmatically***

Sample SPAREPART Analysis

ASSET DESC: "DOOR, SLIDING, WATERTIGHT"											
MFGR/MDL/SRV: "SEO HAE MARINE SYATEM/2130X920MM/N/A"											
ASSET NUM →		G43070-10	G45327-10	G45330-10	G45418-10	G45458-10	G45459-10	G45460-10	G45461-10	G45466-10	G45467-10
Source →											
SPAREPART	ITEM_DESCRIPTION	THP-9089	THP-9089	THP-9089	THP-9089	THP-9089	THP-9089	THP-9089	THP-9089	THP-9089	THP-9089
380725	KIT:40 MICRON STRAINER,CLEANING,HYD PARTICULATE FILTERS,316 SS,6F,8F,6TF,8TF FILTER SERIES,W/ INSTRUCTIONS	1	1	1	1	1	1	1	1	1	1
402097	HUB,CONDUIT:1/2",RIGID,THREADED,ALUMINUM,WIT H SEALING RING & NUT,INSULATED THROAT,GROUNDING,WATER-TIGHT,STAG1 MYERS,SCRU-TITESERIES										1
428826	WASHER,FLAT:PLAIN STEEL,3" OD,1-3/8" ID X 0.165" THK,USS,ANSI B18.22.1	1	1	1	1	1	1	1	1	1	1
807824	SWITCH,LEVEL:24VDC,OIL										
807841	SWITCH,PROXIMITY:INDUCTIVE,48VDC 100MA,18MM DIA X 50MM LG,TUBULAR INDUCTIVE,5MM SENSING RANGE,PLASTIC BRACKET MOUNT,1NO,2 WIRE 20 AWG PVR CABLE,SENSOR										1
807847	SEAL:CYLINDER DUST										1
807860	PUMP,ROTARY:GEAR,26MM INLET X 26MM OUTLET PORT,240 BAR				1						
807889	SEAL:CYLINDER DUST						1				
809876	O-RING:WITH BACK-UP RING FOR G35										1
809878	PACKING,RING:WITH BACK UP RING,ROD										1
809883	SEAL:DUST				0		0				
822285	KIT:REBUILD,RAM,WATERTIGHT DOOR										
823031	HORN:AUDIBLE ALARM,24VDC,879EX-G1				1					1	
823868	ELEMENT,FILTER:MPF-RETURN FILTERS,210GPM,RESIN IMPREGNATED PAPER		1								

Determination of Identical Assets

Option 1: Classification & Description

Option 2: Specifications

- All Assets must be classified & have Templates
- Major effort to collect Attribute values
- Determination of Identical Assets is difficult

Option 3: [Type,] Manufacturer, Model, Other
“Characteristics”

SPAREPART Development (SPD) Software

- Multi-Site functionality
- User Security
- Status Tracking
- Design and navigation similar to Maximo
 - Minimal training
 - Tabs for Searching, Assets, Group Assets, Documents, RSPLs/ SPAREPARTs
 - Table and Detail data windows
 - Actions specific to respective tabs
- Automatic match of SPAREPARTs to Item Masters
- Facilitates match of RSPL Line Items to Item Masters
- Reports to monitor progress, quality, and actions
- Data Review and Data Load Sheets

- **Performed programmatically**
- **44 routines in 4 primary categories:**
 - Management Information
 - Quality Control
 - Metrics
 - Client Review/Load

Primary Results

- **11,877 critical Assets for 4 offshore sites:**
- **New Data:**
 - 86% increase in SPAREPART records
 - 57% increase in Manufacturers
 - 58% increase in Model Numbers
 - 2000+ Document Links
- **Projected Savings: \$878K/month**
- **Project Cost: \$1.2M**

Peripheral Data Issues

- **Missing Asset Documentation**
- **Failure Classes:**
 - Inconsistent
 - Insufficient granularity
 - Failure Analyses are meaningless
- **Inconsistent Rotating Item Masters within Asset Groups**
- **Questionable SPAREPART records**
- **Duplicate SPAREPART records**
- **Different SPAREPARTs, identical Item Descriptions**
- **“False Duplicate” Item Masters**
- **SPD-unique data**

Recommendations

- **1st: Asset Criticality Assessment/Validation**
- **2nd: Repair/Spares Strategy**
- **Require vendors to provide RSPLs**
 - Database
 - Excel template
 - Native file or PDF of native file
 - No images
 - Separate Document, one per Asset
- **Add “Manufacturer’s Description” to Item Masters and POs**

Questions?



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Thank You

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