ASSET MAINTENANCE - SPARE PARTS & INVENTORY NEEDS ANALYSIS

Introduction

- Presentation outlines asset maintenance spare parts and inventory needs analysis using ***'MMAPS Asset Maintenance Spare Parts & Inventory Needs Analysis'*** workbook.
- Workbook comprises the following worksheets:
  - ***'1. Spares-Inventory Strategy'*** (flow chart)
  - ***'2. Asset Spares Review Process'*** contains a flowchart laying out spares / inventory analysis steps.
  - ***'3. Parent Asset Data'*** is used to collate the asset criticality, asset maintenance history, future maintenance requirements and OEM data required to support spares and inventory stockholding analysis in worksheet #4.
  - ***'4. Spares-Inventory Analysis'*** is used to analyse spares and inventory stockholding.
  - ***'5. RFI Proforma-OEM Supply Chain'*** is a proforma used for requests for supply chain information from OEMs and suppliers such as lead times and unit costs etc.
  - ***'6. Associated Dropdown Lists'***
- Analysis worksheets' features include;
  - Multiple worksheet cell explanatory notes re spare parts analysis and worksheet usage.
  - Automatic shading of active rows and columns on selection to reduce entry errors.
  - Outline grouping of worksheet columns with second tier data (on which top tier data columns depend) to keep worksheet size manageable in terms of data entry and report printing etc.
  - Frequent use of cell dropdown lists to reduce effort and improve effectiveness. Columns with cell dropdown lists are shaded light green.
  - Frequent use of cell formulae to reduce effort and improve effectiveness. Columns with cell formulae are shaded light blue.
- Slide 3 outlines basic strategy for assessment of appropriate spares stockholding.
- Slides 4 & 5 form a continuous, animated flow chart outlining the process of spare parts and inventory needs analysis.
- Slides 6, 7 & 8 show images of worksheets ***'3. Parent Asset Data'*** and ***'4. Spares-Inventory Analysis'*** i.e., basic worksheets with outline groups closed and separate images of expanded outline groups
- Slide 9 shows image of worksheet ***'5. RFI Pro Forma-OEM Supply Chain'***
- Slide 10 shows image of worksheet ***'6. Associated Drop Down Lists'***

Strategy for assessment of appropriate spare parts stockholding:

Assessment of maintenance spares stockholding is based on reasonable, realistic assessment of:

- parent asset criticality according to required OEE.
- spares usage over past 5 years of operation.
- spares likely to be required for on-condition maintenance, preventive maintenance, corrective maintenance, and overhauls of assets over next 5 to 7 years of operation.
- supply chain effectiveness including spares availability, spares delivery lead times and EOQs.

The aim of this approach is to optimise spares availability for maintenance and to minimise inventory levels and effects of any unforeseen operational events in line with assessed demand by ensuring:

- parent assets are identified and correctly documented.
- appropriate specifications and supply details of spares likely to be needed are identified and documented.
- anticipated spares usage is assessed and documented.
- appropriate inventory maximum and minimum stock levels are identified and documented.

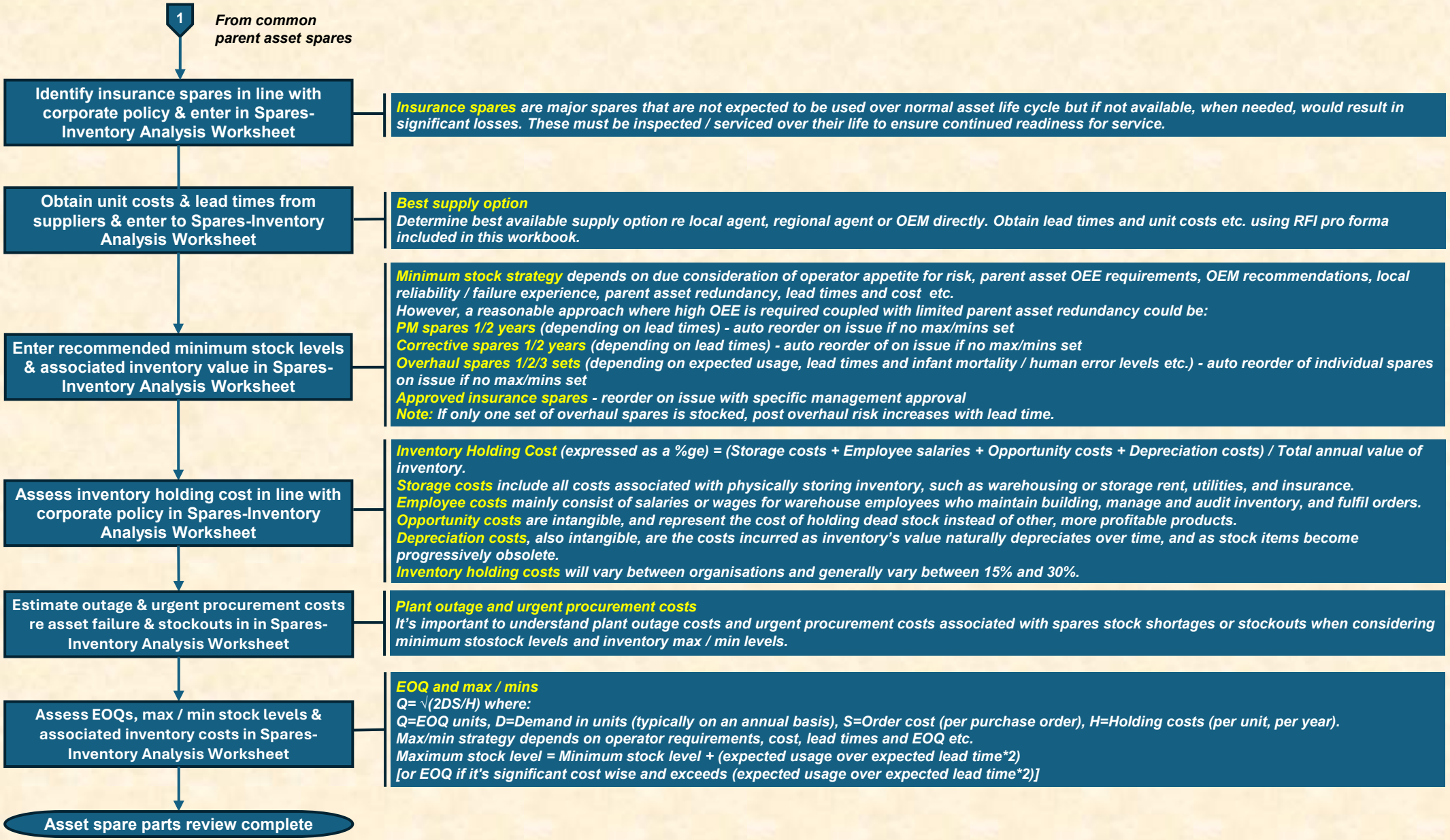
Basing inventory stock holding on historical spares usage, anticipated future corrective / preventive spares usage and minimum future overhaul spares usage minimises risk of stock shortfalls. Stock levels so derived, require regular review and adjustment over time as circumstances and demand change.

ASSET MAINTENANCE - SPARE PARTS & INVENTORY NEEDS ANALYSIS WORKBOOK

FLOW CHART - SPARE PARTS & INVENTORY NEEDS ANALYSIS' - SLIDE 1/2

ASSET MAINTENANCE - SPARE PARTS & INVENTORY NEEDS ANALYSIS WORKBOOK

FLOW CHART - SPARE PARTS & INVENTORY NEEDS ANALYSIS - SLIDE 2/2



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WORKSHEET '3. PARENT ASSET DATA'

Basic worksheet with one outline group open and one closed

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Columns D:F TARGET OEE CRITERIA

Columns K:S PARENT ASSET MAINTENANCE OVERVIEW\

PROPRIETARY SPARE PARTS & INVENTORY NEEDS ANALYSIS - PARENT ASSET DATA

Print A3, column DEF group closed

Formula *Drop down list*

Parent Asset Operational Data							Parent Asset Maintenance Overview									Parent Asset OEM Data			
Tag ID	Description	Redundancy %	Target OEE (%)	Non-critical Downtime (Hours)	Non-critical Outage Cost per Hour ($)	Critical Outage Cost per Hour ($)	Previous Significant Failures	Previous Significant Failure Interval (Hours)	Previous Corrective Work Description	Previous Corrective Work Interval (Hours)	Applicable PM Procedures	PM Interval (Hours)	Expected Overhaul Interval (Hours)	Expected Date of Next Overhaul	Expected Overhauls Over Next 5 Years	OEM	Supplier	OEM Model No	OEM Description
			0%																
			0%																

D E F

ORY NEEDS ANA

Operational Data

Target OEE Availability (%)	Target OEE Performance (%)	Target OEE Quality (%)

3. Parent Asset Data Worksheet Columns D/E/F outline group

BS

Estimated Inventory Holding Cost for Proposed Maximum Stock Levels $
$ -
$ -

4. Spares-Inventory Analysis Worksheet Column BS outline group

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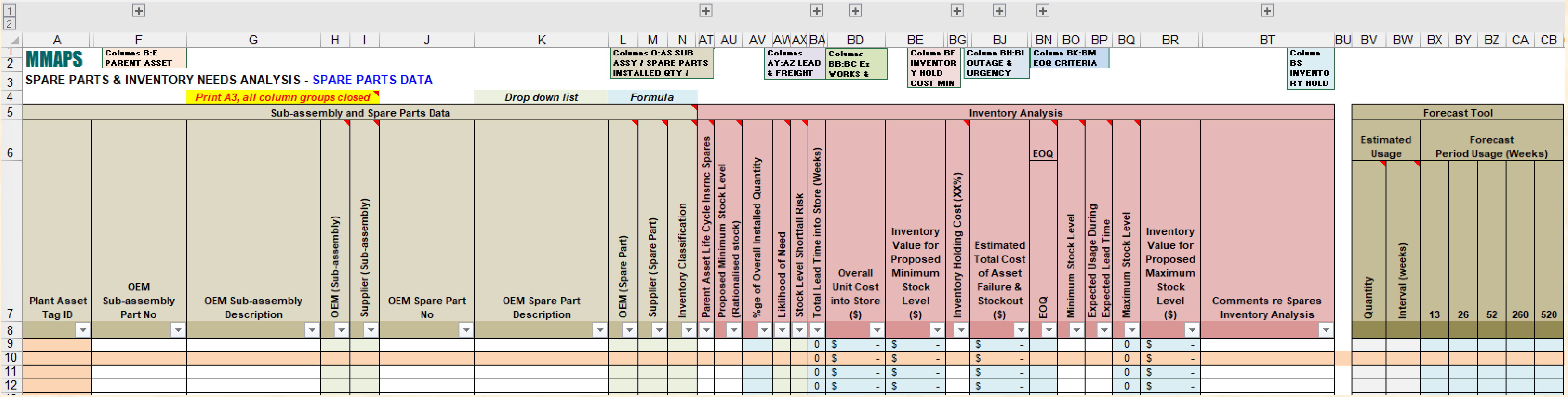
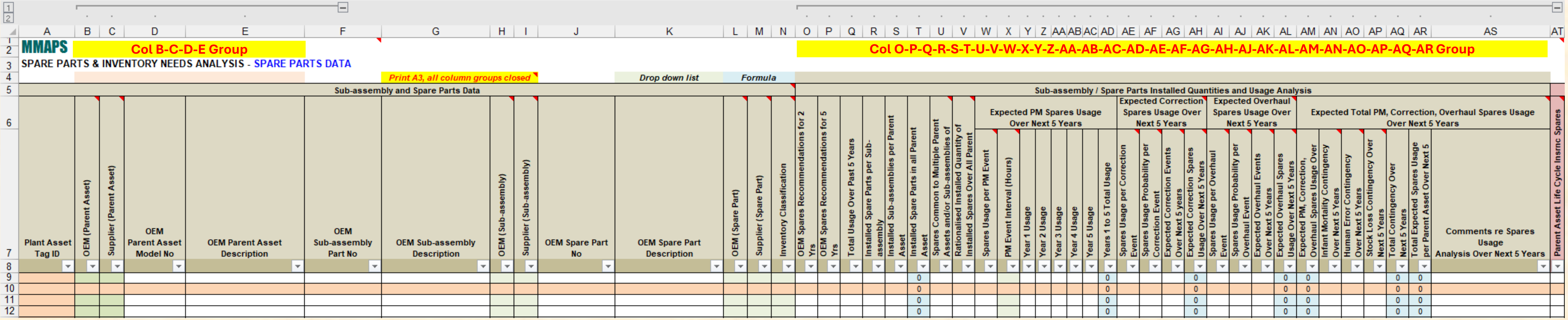
WORKSHEET '4. SPARES-INVENTORY ANALYSIS' - SLIDE 1/2

Basic worksheet with all outline groups closed



Outline groups open – columns A:AS



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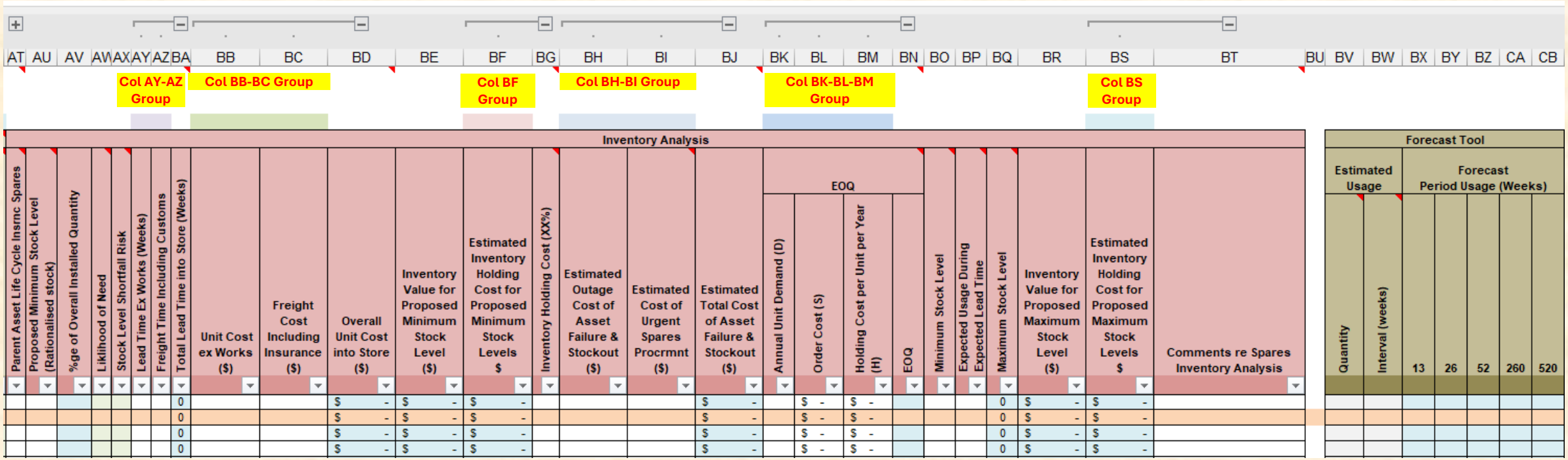
WORKSHEET '4. SPARES-INVENTORY ANALYSIS' - SLIDE 2/2

Outline groups open – columns AT:CB



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PROPIETARY SPARES - RFI PRO FORMA Re OEM SUPPLY CHAIN

RFI pro forma(s) remitted to OEM(s) under appropriate cover letter(s) precede formal RFQ(s) and solicit OEM supply chain information as a basis for finalising spares recommendations.

OEM / Supplier:

Asset OEM Model No:

Asset OEM Serial No:

Asset OEM Description:

Line Item ID	OEM Sub-assembly Part No	OEM Sub-assembly Description	OEM Spare Part No	OEM Spare Part Description	OEM Point of Supply	Normal Lead Time Ex Works (Weeks)	Worst Lead Time Ex Works (Weeks)	Normal Lead Time Probability	Freight Time Including Customs	Unit Cost Ex Works ($)	Freight Cost	Overall Unit Cost into Store ($)	EOQ
1													
2													
3													

WORKSHEET '6. ASSOCIATED DROP DOWN LISTS'

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PROPRIETARY SPARE PARTS AND INVENTORY NEEDS ANALYSIS
ASSOCIATED DROP DOWN LISTS

OEM *(Insert codes and names)*		SUPPLIER *(Insert codes and names)*	
CODE	NAME	CODE	NAME

INVENTORY CLASSIFICATION	
CODE	DESCRIPTION
SAR	Sub-assembly repairable
SANR	Sub-assembly not repairable
SAI	Sub-assembly insurance
SPC	Spare part consumable
SPR	Spare part repairable
SPNR	Spare part not repairable
SPI	Spare part insurance

LIKLIHOOD OF NEED	
CODE	DESCRIPTION
1	Low
2	Medium
3	High

STOCK LEVEL SHORTFALL RISK	
CODE	DESCRIPTION
1	Low
2	Medium
3	High

FREQUENCY / INTERVAL	
Hrs	Period Description
40	40 Hr Week
80	40 Hr/W Fortnight
160	40 Hr/W Month
320	40 Hr/W 2-Month
480	40 Hr/W 3-Month
640	40 Hr/W 4-Month
960	40 Hr/W 6-Month
2080	40 Hr/W Year
3120	40 Hr/W 18-Month
4160	40 Hr/W 2-Year
6240	40 Hr/W 3-Year
8320	40 Hr/W 4-Year
10400	40 Hr/W 5-Year
20800	40 Hr/W 10-Year
168	24 Hr/D Week
336	24Hr/D Fortnight
720	24 Hr/D Month (30D)
1440	24 Hr/D 2-Month (30D)
2160	24 Hr/D 3-Month (30D)
2880	24 Hr/D 4-month (30D)
4320	24 Hr/D 6-Month (30D)
8760	24 Hr/D Year (365D)
13080	24 Hr/D 18-Month
17520	24 Hr/D 2-Year (365D)
26280	24 Hr/D 3-Year (365D)
35040	24 Hr/D 4-Year (365D)
43800	24Hr/D 5-Year (365D)
87600	24 Hr/D 10-Year (365D)

FREQUENCY / INTERVAL			
Hrs	Period	Hrs	Period
40	40 Hr Week	168	24 Hr/D Week
80	40 Hr/W Fortnight	336	24Hr/D Fortnight
160	40 Hr/W Month	720	24 Hr/D Month (30D)
320	40 Hr/W 2-Month	1440	24 Hr/D 2-Month (30D)
480	40 Hr/W 3-Month	2160	24 Hr/D 3-Month (30D)
640	40 Hr/W 4-Month	2880	24 Hr/D 4-month (30D)
960	40 Hr/W 6-Month	4320	24 Hr/D 6-Month (30D)
2080	40 Hr/W Year	8760	24 Hr/D Year (365D)
3120	40 Hr/W 18-Month	13080	24 Hr/D 18-Month
4160	40 Hr/W 2-Year	17520	24 Hr/D 2-Year (365D)
6240	40 Hr/W 3-Year	26280	24 Hr/D 3-Year (365D)
8320	40 Hr/W 4-Year	35040	24 Hr/D 4-Year (365D)
10400	40 Hr/W 5-Year	43800	24Hr/D 5-Year (365D)
20800	40 Hr/W 10-Year	87600	24 Hr/D 10-Year (365D)