

Mutual Consultants



RCS0903

Reliability-centred Spares

RCS

“An approach for determining the level of spare part inventories based on through-life costing and requirements of the equipment and the maintenance operation that the equipment supports”



RCS

Overview of Reliability-centred Spares (RCS)

Definition

Reliability-centred Spares (**RCS**) is an approach for determining the level of spare part inventories based on through-life costing and the requirements of the equipment and maintenance operation that the inventory supports.

Through-life Costing

RCS uses through-life costing to ensure that every pound invested in spare parts is spent where it will do the most good. **RCS** answers the question of whether money should be invested in spares in order to reduce downtime costs in the future. All parties (including accountants!) relate to **RCS** as it determines spare part levels without relying on gut feel or subjective judgment.

Insurance Spares

Substantial savings can be made by applying **RCS** to expensive, slow-moving critical spares. Vendor stockholding schemes may also be evaluated against the alternative of holding stock locally.

The History

Traditionally, stock levels were determined by a mixture of gut feel, manufacturer's recommendations and subjective judgments of service level. None of these addresses the fundamental question - *"is it worth buying a spare part, and if so, how many?"*

Application

RCS can be applied at any time in an asset's life-cycle (ie before buying any spare parts or when an asset has been in service for some time). It can be applied selectively to the spares inventory by using the pareto principle since a small number of items are usually responsible for a large proportion of inventory value and/or could incur large production losses in the event of a stockout.

The Financial Case

Organisations often experience stockouts that have a profound effect on output or customer service. The justification for holding stock is usually financial since stockouts rarely affect safety/environmental integrity.

Benefits

Applied correctly, **RCS** yields the following benefits:

- Unnecessary capital and insurance spares are avoided, freeing up funds and storage space
- The avoidance of "slash and burn" inventory reductions and the corresponding risks to production downtime in the future
- Reductions in the cost of unscheduled downtime due to the non-availability of critical spares
- A means to evaluate vendor stocking costs versus holding stock locally.

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Reliability-centred Spares

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IS IT WORTH BUYING A SPARE PART?

Deciding which spare parts to hold in stock is often a very emotive subject - the engineer wants to know that a part is available when required, whereas the accountant wants to avoid either spending money in the first place or continuing to tie money up in stock.

These spares may vary from cheap consumables to very high value insurance spares that may never be used during the lifetime of the plant. It is not uncommon to find that 50% or more of inventory value is tied up in slow-moving parts (usage less than one per year) and that up to 30% of the inventory (in terms of value) is never used before the plant is decommissioned or scrapped.

Reliability-centred Spares (**RCS**) is an approach for determining spares levels based on the requirements of the equipment, the maintenance operation and the production/process.

Traditionally, stock levels have been determined by a mixture of gut feel, manufacturer's recommendations and subjective judgements of service level. None of these approaches address the fundamental question - ***"is it worth buying a spare part, and if so, how many should be purchased?"***

Many organisations are susceptible to stockouts which can have a profound effect on output or customer service. The justification for holding stock is usually financial since stockouts rarely affect safety or environmental integrity. Substantial savings can be achieved by applying **RCS** to expensive, slow-moving critical spares.

RCS determines the spares levels using through-life costing - it answers the question of whether money should be invested in stock in order to secure lower downtime costs in the future.

WHAT IS RCS?

RCS is "an approach for determining the level of spare part inventories based on through-life costing and the requirements of the equipment and maintenance operation that the inventory supports".

It uses a structured framework to consider the context in which the equipment is operating, what the consequences are if a spare part is not available when required and then uses through-life costing to determine what level of stockholding is required.

The key questions are:

- *What are the maintenance requirements of the equipment?*
- *What happens if a stockout occurs?*
- *Can the spares requirement be anticipated?*
- *What stockholding of the spare is needed?*

IS RCS APPLICABLE TO ME?

Clients apply **RCS** for many reasons and we should be pleased to discuss your specific requirements with you. **RCS** may well be worth considering if one or more of the following applies to you:

- Pressure to reduce existing capital tied up in spares

- Where vendor stockholding is being considered
- The plant has a defined life span (for example, oil extraction where the field is finite or where a product is being withdrawn or new capital investment is planned).

WHY RCS WORKS

The real strength of **RCS** over traditional approaches to establishing spare levels is that it looks at the context in which the plant operates. It considers the spares buying decision on a through-life cost basis and in so doing it answers the question: ***"is it worth buying a spare part, and if so, how many should be purchased?"***

By using through-life costing, **RCS** ensures that every pound spent on spare parts inventory is spent where it will do the most good.

Other methods for determining spare part stockholding levels have disadvantages when compared with **RCS**:

- **Supplier Recommendation** - the supplier has a vested interest in selling spares rather than reducing your through-life costs!
- **Service Level** - (ie the percentage of demands for a spare part that are met successfully from stock) - this can work well for fast-moving stock but does not work well for slow-moving stock. The relationship between the service level required and the number of spares needed is not intuitive and can lead to under-stocking or overstocking of parts and widely variable inventory cost-levels
- **Rationalising Stock-turn** - (ie basing stock levels according to the ratio of the stock used per year to the value of the stock held) - this fails to take into account the consequences of a stockout and is useless for determining the levels of "insurance" spares
- **Criticality Banding** - (ie banding parts according to the criticality of the spare in the event of a stockout) - this can be a useful technique for deciding where to start on a stock analysis but it does not provide any rationale as to how many items should be stocked within a criticality band.

One of the advantages of **RCS** is that the through-life cost parameters used can either be straightforward or complex depending on the information available and the degree of precision required. For example, it is possible to determine the spare part stockholding level with a minimum of information and include a sensitivity analysis in order to determine whether greater precision is required (to ensure more confidence in the resulting stockholding level).

WHY ORGANISATIONS USE RCS

Reliability-centred Spares (**RCS**) is a very powerful approach for determining optimum spare part stockholding based on through-life costing. It helps you to determine the stock levels based directly on the requirements of the equipment, the maintenance operation and the production process.

It overcomes the problems inherent in the traditional methods for determining stock levels (typically a mixture of gut feel, manufacturer's recommendations and subjective judgements of service level). **RCS** answers the fundamental question that all the traditional methods fail to answer **"is it worth buying a spare part, and if so, how many should be purchased?"**

By using through-life costing, **RCS** ensures that every pound invested on spare parts inventory is spent where it will do the most good. Substantial savings can be made by applying **RCS** to expensive, slow-moving critical spares.

RCS can be applied at any time in an asset's life-cycle (ie before buying any spare parts or when an asset has been in service for some time and existing spares levels are being reviewed).

It can also be applied selectively to the spares inventory by using the pareto principle whereby a small number of items are responsible for a large proportion of inventory value and/or could incur large production losses in the event of a stockout.

Vendor stockholding schemes may also be evaluated against the alternative of holding stock locally.

In summary:

- Unnecessary capital and insurance spares are avoided, freeing up funds and storage space
- The avoidance of "slash and burn" inventory reductions and the corresponding risks to production downtime in the future
- Reductions in the cost of unscheduled downtime due to the non-availability of critical spares
- A means to evaluate vendor stocking costs versus holding stock locally.

IMPLEMENTING RCS

RCS can be applied at any time in an asset's life-cycle (ie before buying any spare parts or when an asset has been in service for some time and existing spares levels are being reviewed). In either case **RCS** determines stockholding levels based directly upon the requirements of the equipment, maintenance operation and production process - **input will, therefore, be required from both maintenance and operations when applying RCS.**

One of the "human" benefits of **RCS** is improved communication between engineering, production and inventory personnel. **RCS** is an approach that all parties can relate to as it provides an auditable

justification for spare part stockholding that does not rely on "gut feel" or subjective judgment.

A review of a complete engineering inventory (which might involve thousands of items) is rarely justified - many clients only apply RCS to 'insurance'/slow moving spares.

For many items, consumption may be predicted and hence stockholding levels determined conventionally (although **RCS** could be used).

One of the advantages of **RCS** is that the through-life cost parameters used can either be straightforward or complex depending on the information available and the degree of precision required. It is possible to determine the spare part stockholding level with a minimum of information and include a sensitivity analysis in order to determine whether greater precision is required (to provide greater confidence in the results).

Not all items have equal value or impact (in the event of a stockout) and so we should be pleased to discuss with you "where to start".

WHAT RCS ACHIEVES

Applied correctly, **RCS** will yield the following benefits:

- Unnecessary capital and insurance spares are avoided, freeing up funds and storage space
- The avoidance of "slash and burn" inventory reductions and the corresponding risks to production downtime in the future
- Reductions in the cost of unscheduled downtime due to the non-availability of critical spares
- A means to evaluate vendor stocking costs versus holding stock locally.

MUTUAL CONSULTANTS' ROLE

Our role is to work closely with clients during the application of **RCS** to ensure that their spare parts inventory fully supports the associated equipment's operational and maintenance needs.

This is achieved via a combination of the following services:

- Contract facilitation (where appropriate)
- On-site technical support
- Calculating spare part stock levels using the **RCS** approach

If you would like further information or then please click [here](#).

*For More Information
Please Contact*

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