Stock Theories and Practices

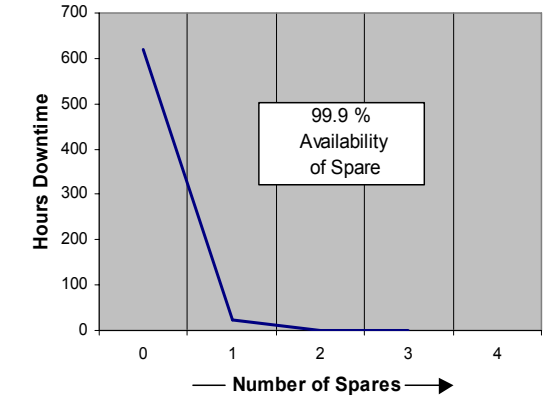
We keep spares to ensure that there is no delay to performing overhauls or resolving equipment breakdowns, due to there being no spare part(s). If spares are part of a piece of equipment necessary for continued production (including associated safety systems) then production will be lost if it is not available when required.

These spares are managed in two ways:

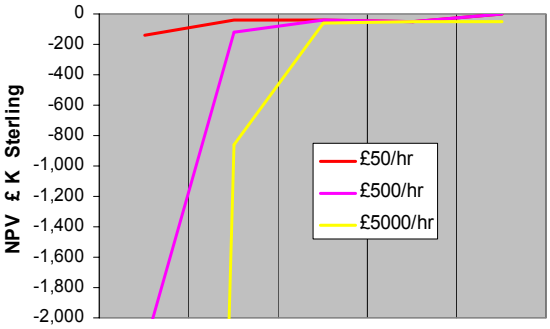
1. Fast Moving spares (typically bolts, washers, oil, etc.) by re-ordering when the stock reduces to a buffer level such that the new block of stock arrives before the existing stock runs out, much like a supermarket. These items tend to have low unit cost and be readily available.
2. Slow Moving spares (typically large bearings, rotors, impellers, electronic units etc.). These items tend to be expensive and have a long lead-time. The number held in stock is determined by optimising the cost of the holding against the lost in value of product. Under this strategy it is not a problem being out of stock as long as the replacement is likely to be restocked with a high probability before the next failure.

There are normally many variables used when reviewing stockholding calculations. The normal method is to choose the number of spares that maximise NPV (Net Present Value), taking into account the cost of the spare and loss of revenue if the spare is not available. This method however requires many inputs.

SNOINO (www.snoino.com) have investigated the relationship between NPV and availability (the latter requiring far fewer inputs). These are shown graphically below. As can be seen from the graphs, the most sensitive area is going from zero to one spare. Carrying one spare thus reduces most of the risk of lost production. Further work has indicated that there is little difference between 99.9% availability of the spare and the NPV for the production likely to be lost, using a range of parameters in the box. This leads to the conclusion that only two levels of criticality are required - critical or non-critical. A spare has the potential to effect revenue or not. If it does not, then it should not be kept! By adopting the target availability of spares approach, the mathematics is considerably simplified.



Relationship Between NPV & Availability of a Spare



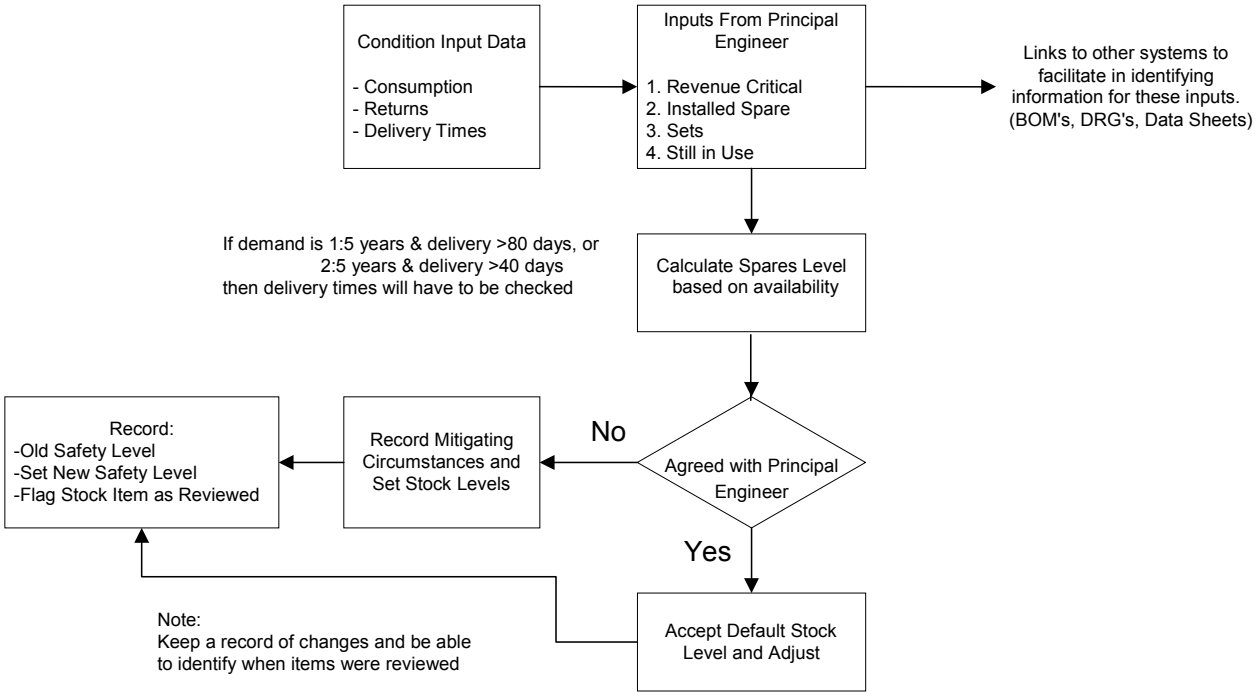
Cost of Spare = £ 10,000
Re-Supply Time = 10 Weeks
Demand Rate = Once Every 2.5 yrs

How to Conduct a Site Review

A review of stock held consists of several steps:

- **checking the accuracy and completeness of the data,**
- **preparing for site review** - collating information, preparing initial stock recommendation based on the data available, advising site of who should be involved and what is expected of them,
- **site review** - going methodically through each stock item to determine and record all inputs likely to effect the stocking recommendation, agreeing initial stock recommendation if no change of inputs,
- **analyzing site input** - re-running the calculation and/or agreeing rationale for all items not agreed in the site visit, formalizing the records,
- **close out of study** - summarizing, reporting and presenting the results.

These are summarized in the flowchart below:



Process Flow used to Evaluate Sparing Levels

Where stock reduction is identified, unless a significant value can be realized, run the stock item(s) down, do NOT dispose of them.

Studies have identified an overall saving of 20-25% in re-stocking costs.

If you would like further details of the above methodology, please contact Eric Rossiter (eric@snoino.com)