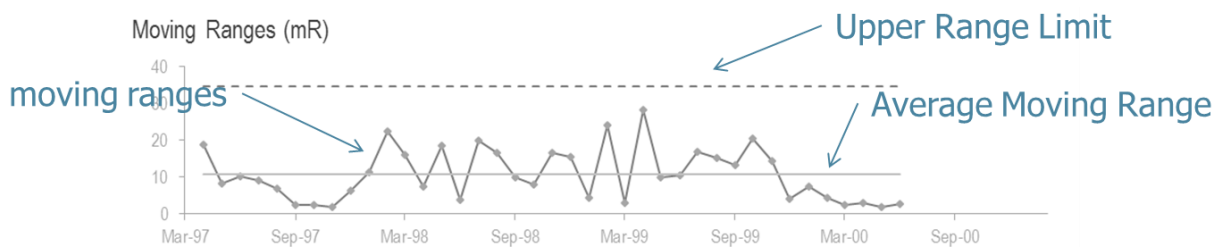
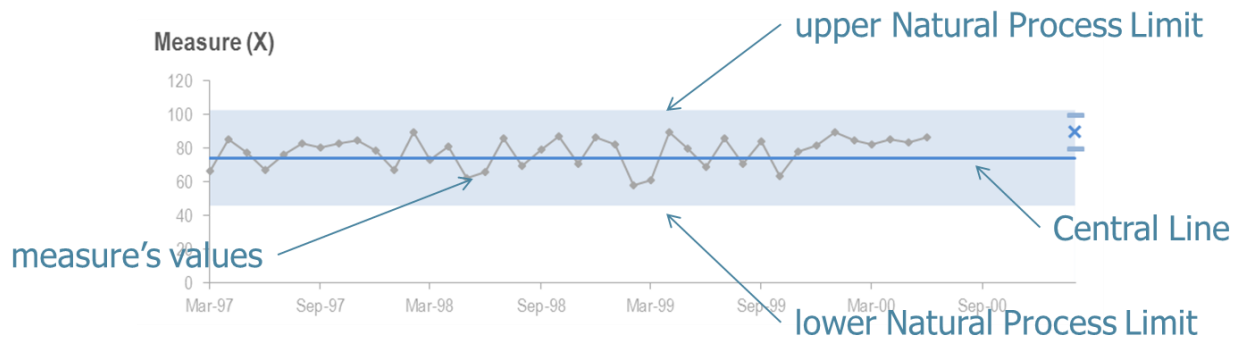


# PUMP

## SUMMARY PAGE

### PuMP Step 6: XmR Chart Anatomy



#### Measure Values

XmR Charts can be created using as few as 5 points – which means 5 consecutive values of your performance measure. Sometimes – when your measure has a lot of variability or is very chaotic – you might need more points than this. But start when you have 5 and keep examining your measure for any indication that you might need more than 5 to make your XmR chart calculations representative.

If you have more than 5 historic measure values, you will find it useful to use 20 or 30 of these, to get some good contextual understanding of historic performance.

#### Central Line

Your performance measure's Central Line is **almost always the average** of the first 5 or so values in the time series of your performance measure. We don't update the Central Line as we add new performance measure values!

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## SUMMARY PAGE

You're **establishing a baseline** with those first 5 or so values, a baseline that describes the performance level for the business process or result you're measuring. Once it's established, you will only change it if your measure shows a signal that performance has changed. So in that sense, the Central Line is a measure of the **current level of performance**. If the current Central Line is 17, then that's what we would say the current level of performance is (not this month's value!).

You'll use this baseline for comparing new or subsequent performance measure values with. That's how you'll determine if and when performance has changed.

### Natural Process Limits

The upper and lower Natural Process Limits on your XmR Chart will define the routine variation for the performance measure. They are set the same distance either side of your XmR Chart's Central Line.

Note: Imagine a measure where your measure cannot logically be less than zero, like *Number of New Customers*. If your Lower Natural Process Limit was calculated to be negative you'd reset it to zero so it made logical sense.

### There are in fact two charts in the traditional XmR chart:

The first is a graph of your performance measure in a time series, with its Central Line and Natural Process Limits. It's called the X chart, traditionally.

The second is a graph of the moving ranges, with the Average Moving Range and the Upper Range Limit. It's called the mR chart. We use both charts in the XmR chart to help find signals of change in performance that aren't just part of the normal "noise" or routine variation.

For the most part, you're going to focus on the X chart, particularly in performance reports and dashboards

### To create an XmR chart

Refer to this introductory guide: [How to Build an XmR Chart for Your KPI](#)