A quantitative risk assessment (QRA) study for a production facility is conducted to estimate the frequencies for each of the possible outcomes from process safety incidents at that facility, to quantify the magnitude associated with those incidents, and most importantly, to calculate the risk associated with that facility, in terms of probable extent of harm or damage expected over a given period of time. A fully rigorous QRA can be quite complex – requiring the analyst to identify every piece of process equipment that might fail, to estimate the magnitude(s) of each potential release, to assign a frequency to each failure scenario, to predict the consequences associated with each scenario, and to combine all of that information to assess the overall risk.

A rigorous QRA can be quite tedious and time consuming – especially when one assumes that every single piece of process equipment in the facility represents a unique failure scenario. However, there are techniques available that can be used to simplify the QRA process without seriously compromising its accuracy. RRS has developed a “grouping” technique that can be used to simplify the process; a “parts count” is still performed to assess failure frequencies, but the failure scenarios are grouped by geographical location and magnitude to significantly reduce the number of scenarios to be investigated. An even simpler technique is available, based on the information found in “Classification of Hazardous Locations” by Cox, Lees, and Ang. The book by Cox et al. contains a “parts count” inventory for a “standard plant”, and in some instances (especially those in which detailed piping and instrumentation diagrams are not available), that “standard plant” inventory can be used to perform a QRA that would otherwise be impossible.