

## Business Case for APQP Implementation in the Aerospace Industry



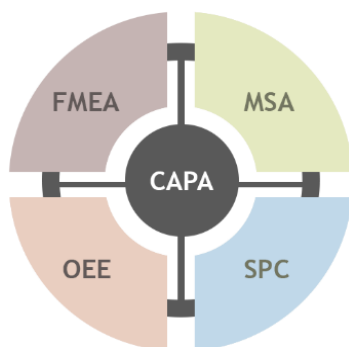
### Introduction

The Aerospace industry is rapidly adopting a Zero Defects approach throughout its supply chain.

Achieving Zero Defects cannot be done successfully with current quality systems. New approaches, like those developed in automotive and semiconductor manufacturing will need to be adopted.

This will require some changes in thinking, commitment and a more proactive approach to quality.

To support, DataLyzor International has nurtured long-term relationships within the manufacturing industry and developed an integrated suite of quality software tools and training materials that are fundamental to implementing and maintaining a Zero Defects programme.



DataLyzor solutions can inform and enable a more proactive approach to quality, to support the achievement of Zero Defects in the aerospace industry. Let us examine this together briefly.

### Zero Defects Through APQP

The aerospace industry already uses various powerful methods and tools for quality, but these are largely reactive and post-process and generally don't prevent defects effectively.

Quality based on traditional inspection techniques will not result in Zero Defects. Quality must be built in from the design stage onwards. This whole process is referred to as Advanced Product Quality Planning (APQP).

To support a more proactive approach to quality, the aerospace industry has developed its own set of standards to help suppliers to develop a consistent approach to Zero Defects through APQP.

Simply stated, the way to achieve Zero Defects for quality is to proactively prevent defects.

A fit for purpose defects prevention strategy requires enhanced capability around quality planning, process control and quality assurance.

The following series of current and upcoming Aerospace Standards provide guidelines for this:

Aerospace Standards	Current	Upcoming
AS13000 Problem Solving	✓	
AS13001 Supplier Self Release Training	✓	
AS13002 Inspection Frequency	✓	
AS13003 Measurement Systems Analysis	✓	
AS13004 PFMEA & Control Plans	✓	
AS13005 Internal & Supplier Audits		✓
AS13006 Process Control	✓	
AS13007 Supplier Management		✓

To enhance your capability around quality planning, process control and quality assurance, Datalyzer provide a holistic solution set which maps to the requirements of current and upcoming Aerospace Standards as follows:

Aerospace Standards	Datalyzer Solutions
AS13000 Problem Solving	FMEA/Control Plan for Proactive D7 Approach
AS13001 Supplier Self Release Training	
AS13002 Inspection Frequency	First Article Inspection (CoA) and SPC
AS13003 Measurement Systems Analysis	Gage Management for Calibration and MSA Studies
AS13004 PFMEA & Control Plans	FMEA /Control Plan
AS13005 Internal & Supplier Audits	DataLyzer FMEA /Control Plan/SPC and CAPA
AS13006 Process Control	SPC
AS13007 Supplier Management	DataLyzer FMEA /Control Plan/SPC and CAPA

## **A Business Case**

Applying APQP without an integrated solution can be a costly activity. DataLyzer see examples of this on a regular basis.

## **APQP Engineering**

What kind of engineering actions are required to apply APQP?

When a customer sends a drawing for a new product, the following APQP activities are required:

A drawing can easily have more than 100 characteristics and associated actions:

- Engineers need to balloon the drawing. If the drawing is not in the required format and/or the supplier does not have ballooning software, the ballooning process can easily take 8 hours. All characteristics need to be ballooned and all characteristics have to be listed with LSL, USL and target.
- In the next step, all this information needs to be entered into a Control Plan and per Control Plan, it needs to be defined how the characteristics will be measured. Required time, 2-6 hours.
- All the characteristics then have to be entered into a CMM program to measure the product. CMM measurement is normally used (at least for First Article Inspection) but is also likely for SPC. Required time, 2-8 hours.
- An MSA study needs to be done for the part. The easiest study is a type 1 study which means that the product will be measured c.30 times and this information then needs to be copied into an MSA program like Excel or Minitab. For 100 characteristics this can easily result in 8 hours of work.
- The FMEA needs to be created for the product. If no reference FMEAs are available, you will then need to copy from an existing FMEA and work from there.
- A Process Flow also needs to be created i.e., where process steps in the FMEA, Control Plan and Process Flow are aligned and maintained. This will be a crucial part during any audits of the FMEA process.
- Based on the Control Plan, a FAIR data sheet needs to be created and all measurements of the CMM and/or from production need to be entered or copied into the FAIR sheet. Required time, 2-6 hours.
- During production, data needs to be collected and registered in Control Charts. Doing this offline, (for example, using Excel or Minitab), is very time consuming and not really effective because you are too late to prevent mistakes and reduce defects. Collecting and copying data is extremely time consuming. *It is not the real time SPC required in AS13006.*
- Feedback from production to engineering and improvement actions during the design and manufacturing process need to be managed in an external integrated system like DataLyzer.

Most of the time wasted outlined above can be prevented or reduced with the Datalyzer APQP suite.

Drawings can be ballooned and the characteristics can be imported instantly into the Control Plan.

Reference FMEAs can be used. The Process Flow, FMEA and Control Plan are linked. The Control Plan and SPC are also integrated and the SPC system can be used for both real time SPC as well as for MSA studies and even manual OEE. CMM and SPC are integrated and FAIR reports can be created instantly.

The engineering time saved can be easily 40 hours in the design phase, per drawing and later 15 minutes per hour per measured product.

#### ***Corrective Actions, CAPA, Audits, Qualification***

Because all core tools are managed in integrated databases, corrective actions and CAPAs can be managed from within the same system. All systems comply with all AS regulations, so you will have less problems during audits and spend less time preparing for audits. Using DataLyzer's powerful integrated solution will also support the qualification process of a new supplier.

#### ***Integration and Big Data***

APQP requires integration between multiple systems. In addition, we nowadays see another approach which is Big Data analysis. Big Data analysis is not much use unless you incorporate SPC. SPC is a mandatory tool to convert Big Data into meaningful and useful information and intelligence.

Companies spend a lot of time on the integration of various systems from multiple vendors and have projects about APQP and Big Data running in parallel without integrating these projects.

Large amounts of money and time are wasted on failing to integrate or trying to integrate these projects.

DataLyzer has realized most of the required integration, not only between the APQP core tools but also between Big Data and SPC and is continuously improving this integration.

#### ***Problem Solving and Six Sigma***

In the case of problem solving or Six Sigma projects, data needs to be collected. Most companies try the DMAIC approach which is a good approach for green field production. In existing production locations, DataLyzer strongly believe it is much more effective to change the order and start with C and then DMAI. Companies are wasting large amounts of their Six Sigma and engineering capacity trying to collect data. We have seen cases that more than 50% of the engineering time in improvement projects is spent simply on collecting data at the shop floor and then processing it in Excel or Minitab for later analysis; massively inefficient and no need for this with DataLyzer!

If you implement DataLyzer solutions in combination with inmotion and OEE, you will save a huge amount of time during data collection so that continuous process improvement becomes a lot more efficient and effective.

### About DataLyzer International

Partners in continuous improvement for 40 years, DataLyzer provides a turnkey solution of training and software solutions including:

- World-class Quality Management Systems consultancy
- [Certificated, eLearning training - APQP, FMEA, Gage Management/MSA, Lean, OEE, Six Sigma and SPC etc.](#)
- [An integrated, modular suite of world-class software solutions](#)
- Global installation and training services with continuing support and advice.

Partners in Continuous Improvement, DataLyzer is the only provider of manufacturing intelligence solutions globally offering integrated tools for FMEA/Process Flow/Balloonning/Control Plan, real-time SPC and OEE with Gage Management for Calibration and MSA studies, COA for reports like FAIR, ISIR and PPAP and CAPA.

DataLyzer software integrates with the big data solution of inmation so that users have both SPC and Big Data available n real-time.

This suite of integrated tools helps our customers to enhance their risk management capability, standardise processes to improve quality, (i.e., to deliver on-time and on-quality), whilst promoting efficiencies, reducing the cost to do so and not least to enhance customer satisfaction and profitability!

**Website** - <https://www.datalyzer.com/>