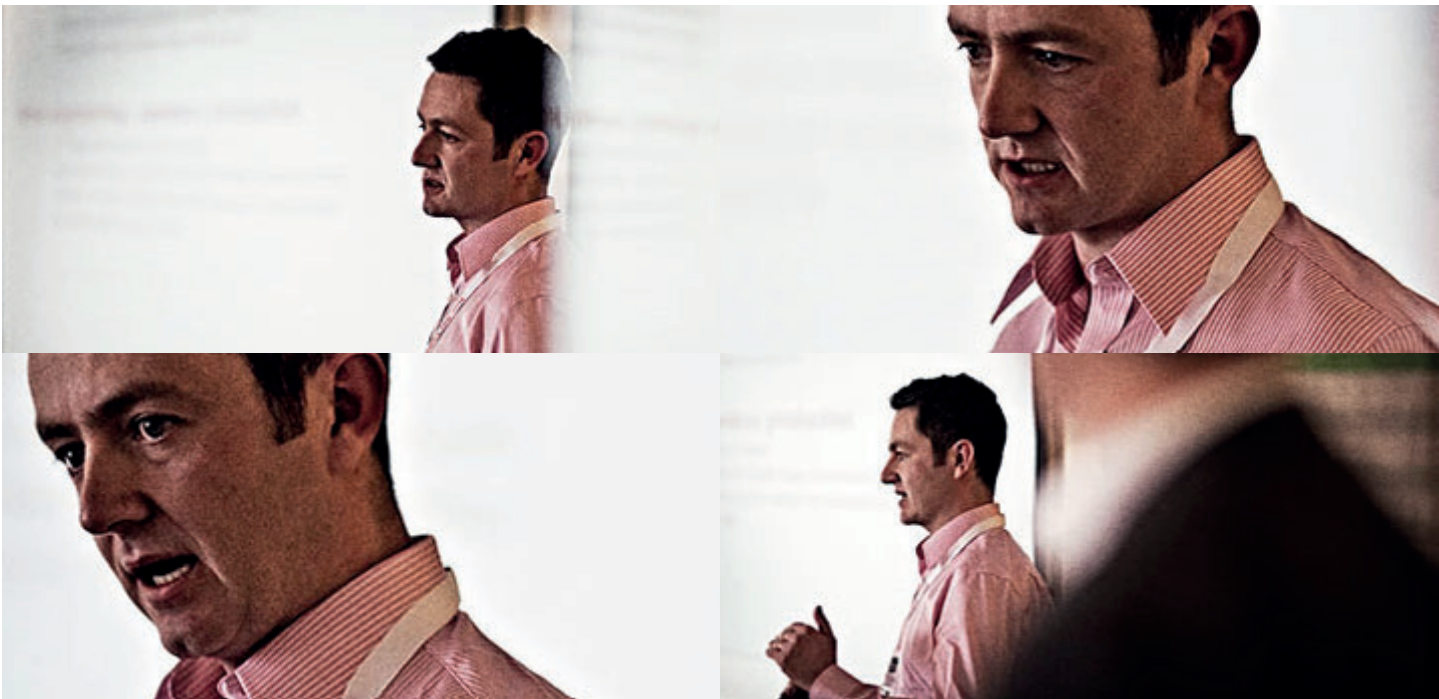


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## 100% Quality achieved through Control of all Details



"Quality expectations and demands are today increasing across the board." says Chris Nuttall, NCAB Group Quality and Technical Manager.

Chris Nuttall has been in charge of quality and technology issues at the NCAB Group Since early 2011. He believes that attaining the highest possible quality can be only be achieved by focusing on all the individual details - from design input through process improvements and onto delivery. So far, the figures are pointing in the right direction, but he stresses that the NCAB Group are only as good as their latest delivery and there is no place for complacency.

Before he took up his new post with the group, Chris Nuttall was involved in setting up the NCAB Group's operation in the UK. Born in Manchester with a father who worked within the PCB industry, he practically grew up in the industry. From summer work during his teens, he worked within various departments and he went on to write a master's thesis on quality management before beginning his career within this industry. His first job was within a PCB manufacturing factory based in Scotland.

"When I realized that the future of volume PCB supply lay in manufacturing in low cost countries, I took up a post as quality engineer

which ultimately lead to the role of supply chain director at one of the NCAB Group's competitors. Based upon a solid technical footing my role developed so that I was very much involved on the commercial side, which focussed upon on how to improve design efficiency, from a cost perspective, whilst at the same time ensuring that the technical or performance characteristics of the PCB were not marginalised." says Chris

In his new role, he feels that the NCAB Group has an excellent team that is open to change and focused on doing things in the best possible way.

**“I was not entirely convinced that it was appropriate to include willingness in the rankings. But in the end it is people who can make the difference and I have come to realize that both performance and willingness are prerequisites for achieving the set objectives.”**

**CHRIS NUTTALL, NCAB GROUP QUALITY AND TECHNICAL MANAGER**

“Continuous improvement is the focal issue for all quality managers and there is a real openness here to work on this in all areas of the organization.”

#### **QUALITY THE NUMBER ONE PRIORITY**

Chris has extensive experience of working with the quality and performance requirements applied in the automotive industry. As a result he has brought in a high degree of quality consciousness to his new role, which is something he believes is right in line with the times:

“Earlier, only customers from the automotive industry demanded that manufacturers lived up to their (automotive) standard of quality. Now we’re seeing other clients as well demanding this. Quality expectations and demands are today increasing across the board.” he says.

The NCAB Group’s vision is to deliver PCBs with zero defects. The quality as perceived by the customer experience is top priority in everything we do and, as Chris Nuttall puts it, the NCAB Group is only as good as its latest delivery. What then, is the NCAB Group doing to live up to its vision?

Chris emphasizes that quality is something that can best be managed by focusing on the individual details all the way from design right

through to delivery. In addition, it is vital to identify the processes across the entire flow in detail. It’s only when you have that level of overview that you can plan for quality throughout the supply chain. He says that it is not only up to him to achieve or influence that. As quality manager, he says he can contribute ideas and support when needed, measure the results and reconnect them to help steer the boat in the right direction, but emphasizes that the quality of NCAB’s deliveries is dependent on everyone involved at every stage.

#### **CAN ADD VALUE AT THE DESIGN STAGE**

The prerequisites that ensure that customers get the quality they want at the best possible total cost can really be determined at the design stage. If the NCAB Group, with its manufacturing expertise, can be brought into the process and add value right from the PCB design stage, it can ensure that the PCBs are designed for volume production.

“Customers in the automotive industry, for example, Stoneridge, have benefited from our expertise at the beginning of the supply chain. The players in this branch expressly seek the best possible quality at the lowest possible cost. Once we get the opportunity to show how we can add value, the customers can realise the extent of the benefits gained through designing for the entire life cycle,



In China, the NCAB Group is working in closely with the factories that are ranked on the basis both of performance and how willing they are to work with the NCAB Group to develop their quality and delivery capability.

compared with, for example, just choosing a design that is optimal for the prototypes.” explains Chris.

**DEVELOPING THE FACTORIES**

The next stage in the chain involves developing processes and technologies for PCB manufacturing in the factories. In this context, the NCAB Group team in China plays a crucial role. They work closely with the factories that are ranked on the basis of both performance and how willing they are to work with the NCAB Group to develop their quality and delivery capabilities.

Initially, Chris was not entirely convinced that it was appropriate to include willingness in the rankings. But he concluded that in the end it is people who can make the difference and he has come to realize that both performance and willingness are prerequisites for achieving the set objectives – what is more important, the mindset to improve or having the skills but no desire to improve on them?

Furthermore, having quality control on the spot in the factories is crucial for the NCAB Group. In this context, Chris says that the group should work to improve its ability to make use of the statistics in targeting the regular audits carried out at the factories. That is why the NCAB Group has started to follow up the numbers every quarter in order to focus on the next quarterly audits. This to be able to constantly work on the areas that specifically need improving and very quickly and visually seeing where we are still to improve.

“We have the biggest and best factory management team in place in China and they are working hard to help the NCAB Group to keep our promises to customers.” says Chris. “We are present at the factories, where we always play a constructive role, since the factories we work with are focused on developing and improving themselves. We want to get the right procedures, processes and methods of verification in place to enhance quality.” he concludes.

**POSITIVE PPM DEVELOPMENT**

For the NCAB Group, Quality assurance is much more than applying various criteria to the product itself. What is equally important is to look at the process, tools and people who use them. Naturally, product monitoring is, at the same time, also essential. One of the key indicators to monitor quality is measured in the number of incorrect order lines in relation to the number of delivered order lines. Another are the PPM (Parts Per Million), as historically driven by the automotive industry.

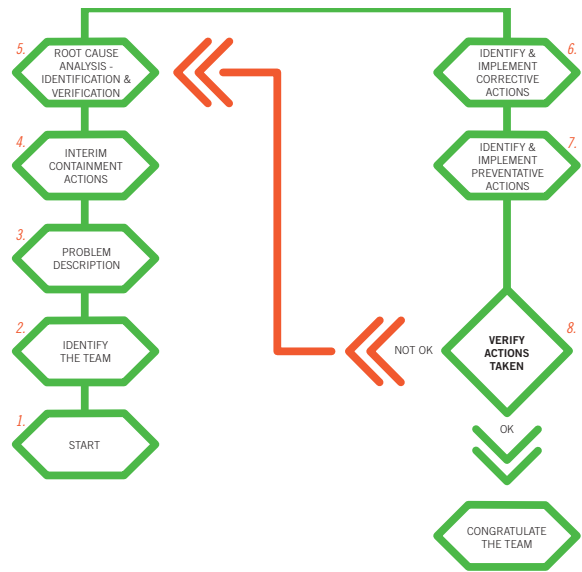
“We are moving in the right direction, so I’m relatively satisfied. But the journey isn’t over.” says Chris. “When customers purchase a PCB, they want the right quality, at the right price and delivered on time. Part of my role is to ensure that quality is the outstanding feature of the NCAB Group. With some customers, we have reduced the annualised figure to 15 PPM, which is very good. We should never rest on our laurels however, but rather constantly work to further improve ourselves.” Chris underlines.

**THE 8-D METHOD WHEN THINGS GO WRONG**

But even if zero defects are a goal and vision, things can sometimes still go wrong. When that happens, Chris would like to treat it as an opportunity to show what you can do to recover. The NCAB Group would in such cases assume responsibility for its entire supply chain backwards. You take control of the situation by using the 8D methodology (see box) and taking measures to correct the problem.

“If we find ourselves with our backs to the wall, we should use it as an opportunity to show our customer the value we’re providing them. We make sure that production keeps running even when something goes wrong and we identify what needs to be done at the factory to contain, resolve and prevent future problems. All the while being fully transparent with the customer so they know exactly what we are doing to in all areas – without such awareness how they can be confident or feel secure that we are making them our primary responsibility.” Chris explains.

**THE 8-D METHOD**



- 1. IDENTIFY THE TEAM**  
Define a team with the right level of knowledge, authority and skills to solve the problem, implement the right corrective and preventative actions. A team leader is essential.
- 2. PROBLEM DESCRIPTION**  
Detailed description using quantifiable terms, images and detailing all factory/traceability aspects. Also confirm if issue is concession/reject (both need action!) & if remakes are needed to keep lines running.
- 3. INTERIM CONTAINMENT ACTIONS**  
Actions necessary to 'ring fence' the problem providing total confidence that we have contained the problem within the supply chain - i.e. how to protect the customer until actions implemented?
- 4. ROOT CAUSE ANALYSIS**  
Failure analysis on any and all potential causes with detailed explanation as what could have caused the concern and the level of contribution per cause towards the problem (not always a singular event.).
- 5. CORRECTIVE ACTIONS - IDENTIFICATION AND IMPLEMENTATION**  
Definition of the actions undertaken to correct the problem - NCAB consider this aspect to be process focused and, again, each action shall have effectiveness in solving the issue defined.
- 6. PREVENTATIVE ACTIONS - IDENTIFICATION AND IMPLEMENTATION**  
The preventative actions are focused at the system to provide confidence that should similar process variation occur then these system based actions will prevent not only reoccurrence but escape too.
- 7. VERIFICATION OF EFFECTIVENESS**  
Final confirmation that the actions implemented will be 100% effective in the resolution of the problem without any negative or detrimental effects being caused to the customer.
- 8. CONGRATULATE THE TEAM INVOLVED**  
Not simply patting each other on the back! This section encompasses recognizing the efforts of those involved communicating the actions taken in solving the problem. i.e. knowledge sharing.

#### MORE CONTROLS PRIOR TO VOLUME PRODUCTION

One thing NCAB Group's quality and technical manager would like to see more of are control measures implemented before the factories start up volume production. That way you can identify potential risks before production gets going.

Chris Nuttall feels that the NCAB group possesses a clear advantage through having local people on site and working with factories that in turn want to work with us. He points out that anyone who tries to do this from afar will get into trouble. "We have a quality team out there who are willing to work with change, while we have lots of good ideas. What we need to do now is just to introduce them at the right time." says Chris and concludes..."Consider that we are working on a painting, equipped with paintbrushes, colours and a canvas. We just need to bring it all together, in the right order, into a beautiful work of art."

**“The NCAB Group possesses a clear advantage through having local people on site and working with factories that in turn want to work with us. Anyone who tries to do this from afar will get into trouble.”**

**CHRIS NUTTALL, KVALITETS- OCH TEKNIKCHEF, NCAB GROUP**

## Prestigious Zero PPM Award goes to NCAB Group

**NCAB Group were recently awarded the prestigious Lean Thinking Award Europe and OPPM Award North America From Stoneridge Electronics. Henrik Kumblad - Commodity Group Manager/ Stoneridge Electronics commented:**

– Stoneridge Electronics is a leading supplier to the automotive, truck, bus and off-road markets. Our products range from telematic systems, driver information systems, and tachographs through electronic control modules and power distribution centers to multiplex systems and cockpit switch modules.

NCAB Group has been a supplier to Stoneridge for many years and has taken important steps to become a long term strategic partner to Stoneridge Electronics. With the sectors largest factory management team, expanding global presence covering all time zones, continued strong solid financial rating, purchasing power and complete process ownership. With guaranteed lead time, capacity, quality level, implemented lean principles and extended knowledge in the automotive sector, we are sure NCAB Group meet the requirements of our demanding industry going forward.

ZERO  
PPM  
AWARD