

Lessons Learned from Toyota, 2010

Failing to "Connect the Dots." How the recent quality troubles plaguing Toyota relates to the SMS implementation efforts in the US Aviation Industry.

During many conversations with colleagues and review of the comments to the ANPRM, one of the statements often repeated is: "we already have a quality management system in place, and do not need another such as SMS." There seems to be an underlying misunderstanding between a quality management system and a safety management system. As the President of Toyota stated in an op-ed article (CNN on-line); "we failed to connect the dots with accelerator problems in the United States and Europe" and "the company needed to improve sharing important quality and safety information across our global operations." I argue, that safety is an unspoken and unwritten quality expectation of our customers, and you cannot separate the two. You can have a quality product or service, as defined by the ISO standards, and still not have a safe product or service. Toyotas' problem clearly accentuates this point.

Part of the confusion stems from the adoption of some of the same types of tools and techniques used in quality management, to manage the safety system. Trade association presidents, and regulators state that SMS is a businesslike approach to managing safety; and this is correct. However, many people falsely assume this to mean that processes designed to produce a quality product, (repeatedly doing the same thing, without variation) equates to the same thing as repeatedly producing a safe product. In Toyotas case, the accelerator parts were manufactured to a specification (an incorrect one), and the quality system would detect any variance of the process, and adjust the process to bring the production back in line with the specification. In effect, Toyota had a quality product. It was produced as designed, repeatedly without variation outside of established limits. Toyota did not have a safe product, and as stated did not connect the dots between failures of the product during use, to failures of the production process. Because quality management systems measure types of data points, geared towards production costs and sales, some people believe these same types of measures with a "businesslike approach" equates to a safety management system.

It is how the tools and techniques are used, along with a focus on investigation of events, which makes the quality and safety management systems different. The quality systems do not investigate incidents or accidents for risk assessment. Quality systems audit output of a process only for variance, and makes adjustments. SMS investigates events, looking for contributing factors from all influencing sources. For example: an altitude deviation will start with establishing if a violation occurred, and if so or not, was it the result of an error, due to risk behavior, latent organizational pathogens, or both. SMS looks at the Human interface aspects (commonly referred to as HFACS) and the organizational, to include the regulatory agencies, the operating environment, and the equipment to determine a root cause and contributing factors.

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One of the purposes of an SMS is to improve the safety performance, and therefore reduce the exposure to risk of having an accident. It is not focused on the safety record per se. Quality systems are focused on continuous improvement also, but through improving the production record rate. This is another source of confusion between the two management system concepts; improving a safety record, is not the same as improving safety performance. There are many aviation companies that have extremely good safety records, but are operating with risky behavior or inadequate organizational structures, and have just not had an accident yet. A good safety record, just like a good quality record, does not guarantee safety. Toyota has for decades been renowned for their outstanding quality, their reputation was built on their quality, yet Toyota is now faced with a failure to connect safety to their quality. We must ask ourselves, how did this happen, and what does it mean to me?

One of the aspects pointed out with Toyotas' problems, has been the management structure, and management involvement. Management's attention and oversight was focused on the business bottom line, and those metrics were quality measures, management was not focused on safety risk assessment or risk management. Safety risk assessment and safety risk management are just some of the components of an SMS, and it requires management involvement. The aviation industry managers should take a lesson learned from Toyota, and ensure that what you do with the management system, i.e. doing the hazard analysis through the investigations of events is not overlooked. The FAA should also take a lesson from this, and ensure the necessary resources are available to connect the dots, between the operators reporting of failures, and the manufactures requirements to correct identified problems. This is where Toyota failed, we should not do the same.

I have read many comments from manufacturers and certified repair shops, that leads one to question if there is a true understanding of the relationship and differences between a quality management systems and a safety management system. Such comments as, the QMS is FAA accepted. How can the FAA accept a QMS, which is not a regulatory requirement. Currently the FAA cannot accept an SMS, and is having problems even dealing with official recognition of an SMS. There is no regulatory QMS framework. Other comments such as, the facility has a quality control manual or quality control department. Again, going back to the Toyota example, quality control is not the same as quality assurance, or safety assurance. There are however, some organizations which do understand the quality and safety interface. Such as comments from TIMCO Aviation Services "The main difference between the QMS and the SMS is the identifying defects (QMS) or identifying hazards (SMS). QMS is more customer driven, dealing with produces and services, but SMS is more of a continuous internal health assessment. Having a QMS satisfies **most** requirements of the **policy portion** of an SMS, which gives us a good base to begin setting up an SMS."

Comments from the organizations that appear to understand the relationships and difference, are those that appear to be able to "connect the dots". These organizations typically have other programs (which are good component parts of an SMS) such as;

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Internal Evaluation Program (IEP), Continuous Analysis and Surveillance (CAS), required for some operators, Aviation Safety Action Programs (ASAP), and other programs such as FOQA. An example of one of these SMS component programs is the required CAS program for certain types of air carriers. The CAS program is a strategic and important element of the SMS. A good CAS program, designed, developed, and implemented can help the air carrier maintenance repair department "connect the dots" between failures in the field. What may be lacking is the FAA's participation in **CONNECTING THE DOTS BETWEEN THE OPERATOR AND THE MANUFACTURER**. As the regulator, with oversight responsibility for both the operators and the manufactures, the FAA should bear the responsibility and liability to ensure the dots are connected and appropriate actions taken, this includes within the regulatory environment as well.

There is a lot to be learned from Toyota's present situation, and how they got where they are. So what are we going to do about it?

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