



Backgrounder

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Quality Management System: Ensuring Our Legacy; Promoting Our Future

Boeing strives to instill quality in everything we do. Boeing employees learn from their first days with the company that they have a personal responsibility for maintaining the company's high standards and striving for continuous improvement. The flying public deserves this commitment; customers demand it. This commitment to quality requires a multi-pronged effort. In addition to employees' personal commitment to quality Boeing regularly monitors the health of its fleet worldwide:

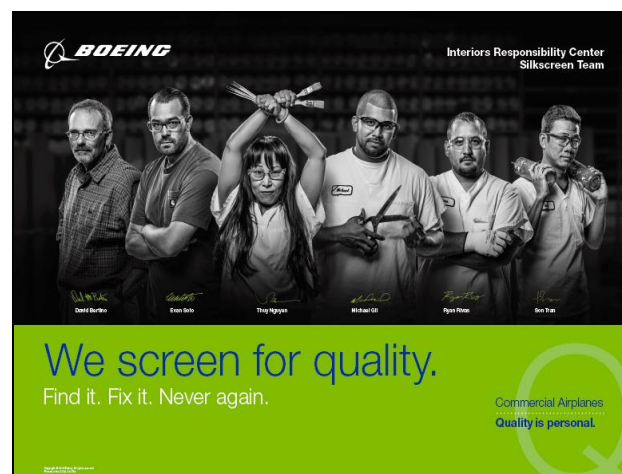
- Through audits and continuous self-inspection, the company reviews its own manufacturing processes, as well as the products it makes.
- By listening to and learning from its customers about what is and isn't working with their airplanes, Boeing quickly addresses potential issues, paying close attention to detail.
- Boeing works closely with the Federal Aviation Administration (FAA) and other government agencies worldwide to make flying safer. The FAA and other regulators rightly expect Boeing to produce safe and compliant airplanes – and respond quickly and effectively to issues.

The first line of defense: Our employees

Boeing's Quality Management System includes a diverse set of oversight processes to identify and then effectively address potential quality issues.

Building a Boeing jetliner takes many parts – from roughly 400,000 in a 737 to about 6 million in a 747 – that are provided by Boeing and its supplier partners around the world. Ensuring that these airplanes and parts meet company standards requires constant monitoring.

Central to that effort is encouraging a value among Boeing employees that "Quality is Personal," a sense that employees are personally accountable for the quality of their work. The company's commitment to quality is reflected by Boeing employees' work ethic.



Employees know they are responsible for the quality of their products and services, and for continually improving the quality of their processes, products and services. They also know what their quality objectives are each day, week, and month, and they know how their personal goals support their organization's objectives. Employees understand the consequences of poor quality products and services and how that poor quality affects Boeing's customers. With an environment of accountability in place, Boeing vigorously pursues a variety of processes to self-identify and address issues within its production system. For example:

- Boeing conducts weekly compliance assessments to review key areas of focus.
- On a monthly basis, upper-level managers lead reviews of performance and compliance data. Results are routinely provided to all levels of the organization so that individuals can see how their own teams are performing, and they can evaluate opportunities for improvement.
- Boeing also has a full-time staff of auditors conducting formal reviews to identify and mitigate special areas of risk across the entire production system.

Listening to customers

Boeing understands that quality is one of the key values it possesses as it works to satisfy customers. The company understands that it must always strive to meet customer requirements and exceed their expectations.

Step one is listening. Boeing does that through direct communication with customers that lives beyond their next order and gets into their business: What are their current needs and future plans? How do they plan to achieve their goals? How can Boeing help? And do they face challenges that Boeing possesses special knowledge of or experience with that might be useful?

Boeing also regularly conducts customer satisfaction surveys to capture the thoughts and experiences of customers using its products. And the company tracks reports in the media and other third-party sources to capture information from industry or consumer groups in addition to customers themselves.

As important as listening is to improving quality, Boeing must also respond effectively to what it hears. That means adopting and following rigorous processes to fix issues. The company's process to fix problems, which is known as the Boeing Problem Solving Model, is the same whether the issue is discovered by a Boeing employee, customer reports or from other sources such as government regulators. The Boeing Problem Solving Model is this:

- Define or describe the problem
- Identify the root cause(s)
- Identify and validate solutions
- Implement the solutions
- Sustain the gains so that the problem stays fixed



Demanding excellence: Regulators

In addition to its own internal review and continuous engagement with customers and suppliers, Boeing also receives independent oversight by the Federal Aviation Administration and similar regulatory bodies around the world monitoring its processes and products.

This is done in multiple ways. Boeing has been designing and manufacturing airplanes for nearly 100 years, including designing and manufacturing commercial jets for more than 50 years.

Boeing has worked with the FAA since 1926, which is when regulation was first introduced authorizing the U.S. federal government to establish airways and navigation standards, issue airworthiness certificates, license pilots and investigate aircraft incidents.

Certification is the process used by the FAA and airplane manufacturers like Boeing to ensure airplane safety. An airplane cannot enter service unless a manufacturer has demonstrated that an airplane complies with applicable airworthiness regulations and the FAA agrees they have been met.

At a high level, the certification process is a series of steps that generally includes planning how to meet federal requirements; gathering non-flight test-compliance data showing compliance; flight testing to show compliance; and finally, closure. At closure, the FAA reviews program and certification documents to assess whether the company satisfied regulatory and compliance requirements,

In practice, this is a complex, time-consuming process. The 787 Dreamliner represents the most exhaustive certification effort ever undertaken at Boeing, not surprising given the range of new technologies, systems and materials embedded in its design.

Boeing applied to the FAA for certification of the 787 on March 28, 2003. This began a process that, over the course of eight years, required thousands of demonstrations of the 787's safety from design review to component testing to system and structural testing to thousands of hours of flight testing.

At the conclusion of the certification process, the FAA reported that its staff logged 200,000 hours of technical work on the 787 type certification. Boeing employees exceeded that mark while showing compliance with more than 1,500 airworthiness regulations and presenting 4,000 documents comprising test plans, flight-test reports and safety requirements relating to inspection, test parts and setup. Boeing received FAA type certification for the Dreamliner in August 2011.

Letters of Investigation from the FAA

A key tool for the FAA in its ongoing regulation of airplane manufacturers is the Letter of Investigation (LOI). LOIs are created when the FAA becomes aware of a potential issue or has a question. The letters typically cover a range of issues. Some are surfaced as a result of FAA audits, some are reported by airlines or by Boeing, itself. The process begins when the FAA sends a letter of investigation (LOI) to an FAA certificate holder (e.g., Boeing) as a notification that they are commencing an inquiry into an allegation of potential non compliance with a federal regulation. The letter invites the certificate holder to respond. Some LOIs result in no action because the FAA is satisfied with the responsive information provided by a certificate holder.

Issuing an LOI requesting a response, and information, is part of the long-standing regulatory oversight process by which airplane manufacturers, operators and regulators work together to ensure compliance with the federal regulations and conformity in manufacturing and

operating aircraft. It is one of the many ways that the FAA exercises its responsibility of oversight of federal regulations.

Within 10 days of receipt of the LOI, Boeing provides the FAA with information addressing the agency's questions. Boeing thoroughly investigates all allegations and if an issue is found to exist, Boeing develops comprehensive corrective action plans to address it.

Some issues require immediate action while others might involve implementation of long-term corrective action. Some simply require renewed emphasis on following existing processes and procedures.

When appropriate, Boeing will make changes or updates to its existing processes and engineering to clarify requirements. The company also may implement additional employee training and supplemental quality inspections. Boeing continues to work with employees to ensure they understand the requirements, and when necessary, it performs audits to ensure corrective actions remain in place.

The FAA typically closes an LOI once it verifies the problem it identified has been fixed and will not recur.

The overarching goal in this LOI process is to ensure compliance and conformity to Boeing's approved processes and procedures and ultimately, the FAA regulations.

Throughout the aviation industry, this has proven to be a successful process that ensures a safe, efficient and reliable manufacturing system.

Boeing's commitment to quality

Boeing is committed to producing safe and reliable airplanes for the flying public, including built in redundancy of some product features that help protect against the risk of failure. The company has robust and redundant processes in place for producing, inspecting and monitoring our products.

Boeing is able to continuously improve its processes and product through:

- Product and process audits accomplished independently by both the FAA and Boeing.
- Disclosures it makes to the FAA.
- Feedback the company receives from operators and other regulatory agencies.

We value this robust process to ensure the quality, reliability and safety of our airplanes. Even with the rise in the number of flights to nearly 25 million per year, commercial aviation is by far the safest form of transportation. Boeing and its employees take great pride in the magnificent commercial aircraft we produce. Building airplanes with superior quality is our legacy and our future.



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