The Air Force A-7D Brake Problem

From the hearing before the Subcommittee on Economy in Government of the Joint Economic Committee of the Congress of the United States, 91st Congress, August 13, 1969.

Mr. Vandiver: In the early part of 1967, the B. F. Goodrich Wheel & Brake Plant at Troy, Ohio, received an order from the Ling-Temco-Vought Co. of Dallas, Texas, to supply wheels and brakes for the A-7D aircraft, built by LTV for the Air Force.

The tests on the wheels and brakes were to be conducted in accordance with the requirements of military specification Mil-W-5013G as prepared and issued by the U.S. Air Force and to the requirements set forth by LTV Specification Document 204-16-37D.

The wheels were successfully tested to the specified requirements, but the brake, manufactured by Goodrich under BEG part No. 2-1162-3, was unable to meet the required tests.

The laboratory tests specified for the brake were divided into two categories: dynamic brake tests and static brake tests. . . .

Generally speaking, the brake passed all the static brakes tests, but the brake could not and did not pass any of the dynamic tests I have just described with the exception of the new brake maximum energy stop.

During the first few attempts to qualify the brake to the dynamic tests, the brake ran out of lining material after a few stops had been completed and the tests were terminated. Attempts were made to secure a lining material that would hold up during the grueling fifty-one-stop test, but to no avail. Although I have been aware for several months that great difficulty was being experienced with the A-7D brake, it was not until April 11, 1968, almost a full year after qualification testing had begun, that I became aware of how these tests were being conducted.

The thirteenth attempt at qualification was being conducted under B. F. Goodrich Internal Test No. T-1867.

On the morning of April 11, Richard Gloor, who was the test engineer assigned to the A-7D project, came to me and told me he had discovered that some time during the previous twenty-four hours, instrumentation used to record brake pressure had been miscalibrated deliberately so that while the instrumentation showed that a pressure of 1,000 pounds per square inch had been used to conduct brake stop numbers 46 and 47 (two overload energy stops) 1,100 p.s.i. had actually been applied to the brakes. Maximum pressure available on the A-7D is 1,000 p.s.i.
Mr. Gloor further told me he had questioned instrumentation personnel about the miscalibration and had been told they were asked to do so by Searle Lawson, a design engineer on the A-7D.

Chairman Proxmire: Is this the gentleman who is with you now, Mr. Vandivier?

Mr. Vandivier: That is correct. I subsequently questioned Lawson who admitted he had ordered the instruments miscalibrated at the direction of a superior.

Upon examining the log sheets kept by laboratory personnel I found that other violations of the test specifications had occurred.

For example, after some of the overload stops, the brake had been disassembled and the three stators or stationary members of the brake had been taken to the plant toolroom for rework and, during an earlier part of the test, the position of elements within the brake had been reversed to distribute the lining wear more evenly.

Additionally, instead of braking the dynamometer to a complete stop as required by military specifications, pressure was released when the wheel and brake speed had decelerated to 10 miles per hour.

The reason for this, I was later told, was that the brakes were experiencing severe vibrations near the end of the stops, causing excessive lining wear and general deterioration of the brake.

All these incidents were in clear violation of military specifications and general industry practice.

I reported these violations to the test lab supervisor, Mr. Ralph Gretzinger, who reprimanded instrumentation personnel and stated that under no circumstance would intentional miscalibration of instruments be tolerated.

As for the other discrepancies noted in test procedures, he said that he was aware that they were happening but that as far as he was concerned the tests could not, in view of the way they were being conducted, be classified as qualification tests.

Later that same day, the worn-brake, maximum energy stop was conducted on the brake. The brake was landed at a speed of 161 m.p.h. and the pressure was applied. The dynamometer rolled a distance of 16,800 feet before coming to rest. The elapsed stopping time was 141 seconds. By computation, this stop time shows the aircraft would have traveled over 3 miles before stopping.

Within a few days, a typewritten copy of the test logs of test T-1867 was sent to LTV to assure LTV that a qualified brake was almost ready for delivery.

Virtually every entry in this so-called copy of the test logs was drastically altered. As an example, the stop time for the worn-brake maximum energy stop was changed from 141 seconds to a mere 46.8 seconds.
On May 2, 1968, the fourteenth attempt to qualify the brakes was begun, and Mr. Lawson told me that he had been informed by both Mr. Robert Sink, project manager at Goodrich—I am sorry, Mr. Sink is project manager—and Mr. Russell Van Horn, projects manager at Goodrich, that "Regardless of what the brake does on test, we're going to qualify it."

Chairman Proxmire: What was that?

Mr. Vandivier: The statement was, "Regardless of what the brake does on test, we're going to qualify it."

He also said that the latest instructions he had received were to the effect that, if the data from this latest test turned out worse than did test T-1867, then we would write our report based on T-1867.

Chairman Proxmire: The statement was made by whom?

Mr. Vandivier: Mr. Lawson told me this statement was made to him by Mr. Robert Sink, project manager, and Mr. Russell Van Horn, project manager.

During this latest and final attempt to qualify the four-rotor brake, the same illegal procedures were used as had been used on attempt No. 13. Again after thirty stops had been completed, the positions of the friction members of the brake were reversed to distribute wear more evenly. After each stop, the wheel was removed from the brake and the accumulated dust was blown out. During each stop, pressure was released when the deceleration had reached 10 miles per hour. . . .

After stop number 48—the third overload stop—temperatures in the brake were so high that the fuse plug, a safety device that allows air to escape from the tire to prevent blowout, melted and allowed the tire to deflate.

The same thing happened after stop number 49—the fourth overload stop. Both these occurrences were highly irregular and in direct conflict with the performance criteria of the military requirements.

Chairman Proxmire: I understand you have a picture of this that might help us see it.

Mr. Vandivier: Yes.

Mr. Proxmire: Do you want to show that to us now?

Mr. Vandivier: I was going to show it here just a little bit later.

Chairman Proxmire: Go ahead. . . .

Mr. Vandivier: All right.

In addition to these highly questionable practices, a turnaround capability test, or simulated mission test, was conducted incorrectly due to a human error. When the error was later discovered, no corrections were made.

While these tests were being conducted, I was asked by Mr. Lawson to begin writing a qualification report for the brake. I flatly refused and told Mr. Gretzinger, the lab supervisor, who was my superior, that I could not write such a report because the brake had not been qualified.
He agreed and he said that no one in the laboratory was going to issue such a report unless a brake was actually qualified in accordance with the specification and using standard operating procedures.

He said that he would speak to his own supervisor, the manager of the technical services section, Mr. Russell Line, and get the matter settled at once.

He consulted Mr. Line and assured me that both had concurred in the decision not to write a qualification report.

I explained to Lawson that I had been told not to write the report and that the only way such a report could be written was to falsify test data.

Mr. Lawson said that he was well aware of what was required but that he had been ordered to get a report written, regardless of how or what had to be done.

He stated that, if I would not write the report, he would have to, and he asked if I would help him gather the test data and draw up the various engineering curves and graphic displays that are normally included in a report.

I asked Mr. Gretzinger, my superior, if this was all right and he agreed. As long as I was only assisting in the preparation of the data, it would be permissible.

Both Lawson and I worked on the elaborate curves and logs in the report for nearly a month. During this time we both frankly discussed the moral aspects of what we were doing, and we agreed that our actions were unethical and probably illegal.

Several times during that month I discussed the A-7D testing with Mr. Line and asked him to consult his superiors in Akron to prevent a false qualification report from being issued. Mr. Line declined to do so and advised me that it would be wise to just do my work and keep quiet.

I told him of the extensive irregularities during testing and suggested that the brake was actually dangerous and, if allowed to be installed on an aircraft, might cause an accident.

Mr. Line said he thought I was worrying too much about things that did not really concern me and advised me to just "do what you're told."

About the first of June. . . .

Chairman Proxmire: You skipped one line here.

Mr. Vandiver: Yes.

Chairman Proxmire: You said "I asked him". . . .

Mr. Vandiver: Yes. I asked Mr. Line if his conscience would hurt him if such a thing caused the death of a pilot and this is when he replied that I was worrying about too many things that did not concern me and advised me to "do what you're told."

About the first of June 1968, Mr. Gretzinger asked if I was finished with the graphic data and said he had been advised by the chief engineer, Mr. H. C. Sunderman, that when the data were finished they were to be delivered to him—Sunderman—and he would instruct someone in the engineering department to actually write the report. Accordingly, when I had finished with the data, I gave it to Mr. Gretzinger who immediately took it from the room. Within a few minutes, he was back and was obviously angry.

He said that Mr. Sunderman had told him no one in the engineering department had time to write the report and that we would have to do it ourselves.
At this point, Mr. Line came into the room demanding to know "What the hell is going on." Mr. Gretzinger explained the situation again and said he would not allow such a report to be issued by the lab.

Mr. Line then turned to me and said he was "sick of hearing about this damned report. Write the------thing and shut up about it." . . .

Many, many of the elaborate engineering curves attached to the report were complete and total fabrications, based not on what had actually occurred, but on information that would fool both LTV and the Air Force.

I have mentioned already that the turnaround capability test that was supposed to determine what temperatures might be experienced by the brake during a typical flight mission had been misconducted through a human error on the part of the test lab operator.

Rather than rerun this very important test, which would have taken only some six hours to complete, it was decided to manufacture the data.

This we did, and the result was some very convincing graphic curves. These curves were supposed to demonstrate to LTV and the Air Force exactly what the temperatures in the brakes had been during each minute of the simulated mission.

They were completely false and based only on data that would be acceptable to the customers.

I could spend the entire day here discussing the various elaborate falsifications that went into this report but I feel that, by now, the picture is clear.

The report was finally issued on June 5, 1968, and almost immediately, flight tests on the brake were begun at Edwards Air Force Base in California.

Mr. Lawson was sent to Goodrich to witness these tests, and when he returned, he described various mishaps that had occurred during the flight tests and he expressed the opinion to me that the brake was dangerous.

That same afternoon, I contacted my attorney and after describing the situation to him, asked for his advice. . . .