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CHAPTER ONE

"Why Should My Conscience Bother Me?"

by KERMIT VANDIVIER

THE B. F. Goodrich Co. is what business magazines like to speak of as "a major American corporation." It has operations in a dozen states and as many foreign countries, and of these far-flung facilities, the Goodrich plant at Troy, Ohio, is not the most imposing. It is a small, one-story building, once used to manufacture airplanes. Set in the grassy flatlands of west-central Ohio, it employs only about six hundred people. Nevertheless, it is one of the three largest manufacturers of aircraft wheels and brakes, a leader in a most profitable industry. Goodrich wheels and brakes support such well-known planes as the F111, the C5A, the Boeing 727, the XB70 and many others. Its

customers include almost every aircraft manufacturer in the world.

Contracts for aircraft wheels and brakes often run into millions of dollars, and ordinarily a contract with a total value of less than $70,000, though welcome, would not create any special stir of joy in the hearts of Goodrich sales personnel. But purchase order P-23718, issued on June 18, 1967, by the LTV Aerospace Corporation, and ordering 202 brake assemblies for a new Air Force plane at a total price of $69,417, was received by Goodrich with considerable glee. And there was good reason. Some ten years previously, Goodrich had built a brake for LTV that was, to say the least, considerably less than a rousing success. The brake had not lived up to Goodrich's promises, and after experiencing considerable difficulty, LTV had written off Goodrich as a source of brakes. Since that time, Goodrich salesmen had been unable to sell so much as a shot of brake fluid to LTV. So in 1967, when LTV requested bids on wheels and brakes for the new A7D light attack aircraft it proposed to build for the Air Force, Goodrich submitted a bid that was absurdly low, so low that LTV could not, in all prudence, turn it down.

Goodrich had, in industry parlance, "bought into the business." Not only did the company not expect to make a profit on the deal; it was prepared, if necessary, to lose money. For aircraft brakes are not something that can be ordered off the shelf. They are designed for a particular aircraft, and once an aircraft manufacturer buys a brake, he is forced to purchase all replacement parts from the brake manufacturer. The $70,000 that Goodrich would get for making the brake would be a drop in the bucket when compared with the cost of the linings and other parts

the Air Force would have to buy from Goodrich during the lifetime of the aircraft. Furthermore, the company which manufactures brakes for one particular model of an aircraft quite naturally has the inside track to supply other brakes when the planes are updated and improved.

Thus, that first contract, regardless of the money involved, is very important, and Goodrich, when it learned that it had been awarded the A7D contract, was determined that while it may have slammed the door on its own foot ten years before, this time, the second time around, things would be different. The word was soon circulated throughout the plant: "We can't bungle it this time. We've got to give them a good brake, regardless of the cost."

There was another factor which had undoubtedly influenced LTV. All aircraft brakes made today are of the disk type, and the bid submitted by Goodrich called for a relatively small brake, one containing four disks and weighing only 106 pounds. The weight of any aircraft part is extremely important. The lighter a part is, the heavier the plane's payload can be. The four-rotor, 106-pound brake promised by Goodrich was about as light as could be expected, and this undoubtedly had helped move LTV to award the contract to Goodrich.

The brake was designed by one of Goodrich's most capable engineers, John Warren. A tall, lanky blond and a graduate of Purdue, Warren had come from the Chrysler Corporation seven years before and had become adept at aircraft brake design. The happy-go-lucky manner he usually maintained belied a temper which exploded whenever anyone ventured to offer any criticism of his work, no matter how small. On these occasions, Warren would turn

red in the face, often throwing or slamming something and then stalking from the scene. As his coworkers learned the consequences of criticizing him, they did so less and less readily, and when he submitted his preliminary design for the A7D brake, it was accepted without question.

Warren was named project engineer for the A7D, and he, in turn, assigned the task of producing the final production design to a newcomer to the Goodrich engineering stable, Searle Lawson. Just turned twenty-six, Lawson had been out of the Northrup Institute of Technology only one year when he came to Goodrich in January 1967. Like Warren, he had worked for a while in the automotive industry, but his engineering degree was in aeronautical and astronautical sciences, and when the opportunity came to enter his special field, via Goodrich, he took it. At the Troy plant, Lawson had been assigned to various "paper projects" to break him in, and after several months spent reviewing statistics and old brake designs, he was beginning to fret at the lack of challenge. When told he was being assigned to his first "real" project, he was elated and immediately plunged into his work.

The major portion of the design had already been completed by Warren, and major assemblies for the brake had already been ordered from Goodrich suppliers. Naturally, however, before Goodrich could start making the brakes on a production basis, much testing would have to be done. Lawson would have to determine the best materials to use for the linings and discover what minor adjustments in the design would have to be made.

Then, after the preliminary testing and after the brake was judged ready for production, one whole brake assembly would undergo a series of grueling, simulated braking stops and other severe trials called qualification tests. These tests are required by the military, which gives very detailed specifications on how they are to be conducted, the criteria for failure, and so on. They are performed in the Goodrich plant's test laboratory, where huge machines called dynamometers can simulate the weight and speed of almost any aircraft. After the brakes pass the laboratory tests, they are approved for production, but before the brakes are accepted for use in military service, they must undergo further extensive flight tests.

Searle Lawson was well aware that much work had to be done before the A7D brake could go into production, and he knew that LTV had set the last two weeks in June, 1968, as the starting dates for flight tests. So he decided to begin testing immediately. Goodrich's suppliers had not yet delivered the brake housing and other parts, but the brake disks had arrived, and using the housing from a brake similar in size and weight to the A7D brake, Lawson built a prototype. The prototype was installed in a test wheel and placed on one of the big dynamometers in the plant's test laboratory. The dynamometer was adjusted to simulate the weight of the A7D and Lawson began a series of tests, "landing" the wheel and brake at the A7D's landing speed, and braking it to a stop. The main purpose of these preliminary tests was to learn what temperatures would develop within the brake during the simulated stops and to evaluate the lining materials tentatively selected for use.

During a normal aircraft landing the temperatures inside the brake may reach 1000 degrees, and occasionally a bit higher. During Lawson's first simulated landings, the temperature of his prototype brake reached 1500 degrees. The

brake glowed a bright cherry red and threw off incandescent particles of metal and lining material as the temperature reached its peak. After a few such stops, the brake was dismantled and the linings were found to be almost completely disintegrated. Lawson chalked this first failure up to chance and, ordering new lining materials, tried again.

The second attempt was a repeat of the first. The brake became extremely hot, causing the lining materials to crumble into dust.

After the third such failure, Lawson, inexperienced though he was, knew that the fault lay not in defective parts or unsuitable lining material but in the basic design of the brake itself. Ignoring Warren's original computations, Lawson made his own, and it didn't take him long to discover where the trouble lay—the brake was too small. There simply was not enough surface area on the disks to stop the aircraft without generating the excessive heat that caused the linings to fail.

The answer to the problem was obvious but far from simple—the four-disk brake would have to be scrapped, and a new design, using five disks, would have to be developed. The implications were not lost on Lawson. Such a step would require the junking of all the four-disk-brake subassemblies, many of which had now begun to arrive from the various suppliers. It would also mean several weeks of preliminary design and testing and many more weeks of waiting while the suppliers made and delivered the new subassemblies.

Yet, several weeks had already gone by since LTV's order had arrived, and the date for delivery of the first production brakes for flight testing was only a few months away.

Although project engineer John Warren had more or less turned the A7D over to Lawson, he knew of the difficulties Lawson had been experiencing. He had assured the young engineer that the problem revolved around getting the right kind of lining material. Once that was found, he said, the difficulties would end.

Despite the evidence of the abortive tests and Lawson's careful computations, Warren rejected the suggestion that the four-disk brake was too light for the job. Warren knew that his superior had already told LTV, in rather glowing terms, that the preliminary tests on the A7D brake were very successful. Indeed, Warren's superiors weren't aware at this time of the troubles on the brake. It would have been difficult for Warren to admit not only that he had made a serious error in his calculations and original design but that his mistakes had been caught by a green kid, barely out of college.

Warren's reaction to a five-disk brake was not unexpected by Lawson, and, seeing that the four-disk brake was not to be abandoned so easily, he took his calculations and dismal test results one step up the corporate ladder.

At Goodrich, the man who supervises the engineers working on projects slated for production is called, predictably, the projects manager. The job was held by a short, chubby and bald man named Robert Sink. A man truly devoted to his work, Sink was as likely to be found at his desk at ten o'clock on Sunday night as ten o'clock on Monday morning. His outside interests consisted mainly of tinkering on a Model-A Ford and an occasional game of golf. Some fifteen years before, Sink had begun working at Goodrich as a lowly draftsman. Slowly, he worked his way up. Despite his geniality, Sink was neither respected nor liked by the majority of the engineers, and his ap-

pointment as their supervisor did not improve their feelings about him. They thought he had only gone to high school. It quite naturally rankled those who had gone through years of college and acquired impressive specialties such as thermodynamics and astronautics to be commanded by a man whom they considered their intellectual inferior. But, though Sink had no college training, he had something even more useful: a fine working knowledge of company politics.

Puffing upon a Meerschaum pipe, Sink listened gravely as young Lawson confided his fears about the four-disk brake. Then he examined Lawson's calculations and the results of the abortive tests. Despite the fact that he was not a qualified engineer, in the strictest sense of the word, it must certainly have been obvious to Sink that Lawson's calculations were correct and that a four-disk brake would never have worked on the A7D.

But other things of equal importance were also obvious. First, to concede that Lawson's calculations were correct would also mean conceding that Warren's calculations were incorrect. As projects manager, he not only was responsible for Warren's activities, but, in admitting that Warren had erred, he would have to admit that he had erred in trusting Warren's judgment. It also meant that, as projects manager, it would be he who would have to explain the whole messy situation to the Goodrich hierarchy, not only at Troy but possibly on the corporate level at Goodrich's Akron offices. And, having taken Warren's judgment of the four-disk brake at face value (he was forced to do this since, not being an engineer, he was unable to exercise any engineering judgment of his own), he had assured LTV, not once but several times, that about all there was

left to do on the brake was pack it in a crate and ship it out the back door.

There's really no problem at all, he told Lawson. After all, Warren was an experienced engineer, and if he said the brake would work, it would work. Just keep on testing and probably, maybe even on the very next try, it'll work out just fine.

Lawson was far from convinced, but without the support of his superiors there was little he could do except keep on testing. By now, housings for the four-disk brake had begun to arrive at the plant, and Lawson was able to build up a production model of the brake and begin the formal qualification tests demanded by the military.

The first qualification attempts went exactly as the tests on the prototype had. Terrific heat developed within the brakes and, after a few, short, simulated stops, the linings crumbled. A new type of lining material was ordered and once again an attempt to qualify the brake was made. Again, failure.

Experts were called in from lining manufacturers, and new lining "mixes" were tried, always with the same result. Failure.

It was now the last week in March 1968, and flight tests were scheduled to begin in seventy days. Twelve separate attempts had been made to formally qualify the brake, and all had failed. It was no longer possible for anyone to ignore the glaring truth that the brake was a dismal failure and that nothing short of a major design change could ever make it work.

In the engineering department, panic set in. A glum-faced Lawson prowled the test laboratory dejectedly. Occasionally, Warren would witness some simulated stop on

the brake and, after it was completed, troop silently back to his desk. Sink, too, showed an unusual interest in the trials, and he and Warren would converse in low tones while poring over the results of the latest tests. Even the most inexperienced of the lab technicians and the men who operated the testing equipment knew they had a "bad" brake on their hands, and there was some grumbling about "wasting time on a brake that won't work."

New menaces appeared. An engineering team from LTV arrived at the plant to get a good look at the brake in action. Luckily, they stayed only a few days, and Goodrich engineers managed to cover the true situation without too much difficulty.

On April 4, the thirteenth attempt at qualification was begun. This time no attempt was made to conduct the tests by the methods and techniques spelled out in the military specifications. Regardless of how it had to be done, the brake was to be "nursed" through the required fifty simulated stops.

Fans were set up to provide special cooling. Instead of maintaining pressure on the brake until the test wheel had come to a complete stop, the pressure was reduced when the wheel had decelerated to around 15 mph, allowing it to "coast" to a stop. After each stop, the brake was disassembled and carefully cleaned, and after some of the stops, internal brake parts were machined in order to remove warp and other disfigurations caused by the high heat.

By these and other methods, all clearly contrary to the techniques established by the military specifications, the brake was coaxed through the fifty stops. But even using these methods, the brake could not meet all the requirements. On one stop the wheel rolled for a distance of 16,000 feet, nearly three miles, before the brake could bring it to a stop. The normal distance required for such a stop was around 3500 feet.

On April 11, the day the thirteenth test was completed, I became personally involved in the A7D situation.

I had worked in the Goodrich test laboratory for five years, starting first as an instrumentation engineer, then later becoming a data analyst and technical writer. As part of my duties, I analyzed the reams and reams of instrumentation data that came from the many testing machines in the laboratory, then transcribed it to a more usable form for the engineering department. And when a new-type brake had successfully completed the required qualification tests, I would issue a formal qualification report.

Qualification reports were an accumulation of all the data and test logs compiled by the test technicians during the qualification tests, and were documentary proof that a brake had met all the requirements established by the military specifications and was therefore presumed safe for flight testing. Before actual flight tests were conducted on a brake, qualification reports had to be delivered to the customer and to various government officials.

On April 11, I was looking over the data from the latest A7D test, and I noticed that many irregularities in testing methods had been noted on the test logs.

Technically, of course, there was nothing wrong with conducting tests in any manner desired, so long as the test was for research purposes only. But qualification test methods are clearly delineated by the military, and I

knew that this test had been a formal qualification attempt. One particular notation on the test logs caught my eye. For some of the stops, the instrument which recorded the brake pressure had been deliberately miscalibrated so that, while the brake pressure used during the stops was recorded as 1000 psi (the maximum pressure that would be available on the A7D aircraft), the pressure had actually been 1100 psi!

I showed the test logs to the test lab supervisor, Ralph Gretzinger, who said he had learned from the technician who had miscalibrated the instrument that he had been asked to do so by Lawson. Lawson, said Gretzinger, readily admitted asking for the miscalibration, saying he had been told to do so by Sink.

I asked Gretzinger why anyone would want to miscalibrate the data-recording instruments.

"Why? I'll tell you why," he snorted. "That brake is a failure. It's way too small for the job, and they're not ever going to get it to work. They're getting desperate, and instead of scrapping the damned thing and starting over, they figure they can horse around down here in the lab and qualify it that way."

An expert engineer, Gretzinger had been responsible for several innovations in brake design. It was he who had invented the unique brake system used on the famous XB70. A graduate of Georgia Tech, he was a stickler for detail and he had some very firm ideas about honesty and ethics. "If you want to find out what's going on," said Gretzinger, "ask Lawson, he'll tell you."

Curious, I did ask Lawson the next time he came into the lab. He seemed eager to discuss the A7D and gave me the history of his months of frustrating efforts to get

Warren and Sink to change the brake design. "I just can't believe this is really happening," said Lawson, shaking his head slowly. "This isn't engineering, at least not what I thought it would be. Back in school, I thought that when you were an engineer, you tried to do your best, no matter what it cost. But this is something else."

He sat across the desk from me, his chin propped in his hand. "Just wait," he warned. "You'll get a chance to see what I'm talking about. You're going to get in the act, too, because I've already had the word that we're going to make one more attempt to qualify the brake, and that's it. Win or lose, we're going to issue a qualification report!"

I reminded him that a qualification report could only be issued after a brake had successfully met all military requirements, and therefore, unless the next qualification attempt was a success, no report would be issued.

"You'll find out," retorted Lawson. "I was already told that regardless of what the brake does on test, it's going to be qualified." He said he had been told in those exact words at a conference with Sink and Russell Van Horn.

This was the first indication that Sink had brought his boss, Van Horn, into the mess. Although Van Horn, as manager of the design engineering section, was responsible for the entire department, he was not necessarily familiar with all phases of every project, and it was not uncommon for those under him to exercise the what-he-doesn't-know-won't-hurt-him philosophy. If he was aware of the full extent of the A7D situation, it meant that matters had truly reached a desperate stage—that Sink had decided not only to call for help but was looking toward that moment when blame must be borne and, if possible, shared.

Also, if Van Horn had said, "regardless what the brake does on test, it's going to be qualified," then it could only mean that, if necessary, a false qualification report would be issued! I discussed this possibility with Gretzinger, and he assured me that under no circumstances would such a report ever be issued.

"If they want a qualification report, we'll write them one, but we'll tell it just like it is," he declared emphatically. "No false data or false reports are going to come out of this lab."

On May 2, 1968, the fourteenth and final attempt to qualify the brake was begun. Although the same improper methods used to nurse the brake through the previous tests were employed, it soon became obvious that this too would end in failure.

When the tests were about half completed, Lawson asked if I would start preparing the various engineering curves and graphic displays which were normally incorporated in a qualification report. "It looks as though you'll be writing a qualification report shortly," he said.

I flatly refused to have anything to do with the matter and immediately told Gretzinger what I had been asked to do. He was furious and repeated his previous declaration that under no circumstances would any false data or other matter be issued from the lab.

"I'm going to get this settled right now, once and for all," he declared. "I'm going to see Line [Russell Line, manager of the Goodrich Technical Services Section, of which the test lab was a part] and find out just how far this thing is going to go!" He stormed out of the room.

In about an hour, he returned and called me to his desk. He sat silently for a few moments, then muttered,

half to himself, "I wonder what the hell they'd do if I just quit?" I didn't answer and I didn't ask him what he meant. I knew. He had been beaten down. He had reached the point when the decision had to be made. Defy them now while there was still time—or knuckle under, sell out.

"You know," he went on uncertainly, looking down at his desk, "I've been an engineer for a long time, and I've always believed that ethics and integrity were every bit as important as theorems and formulas, and never once has anything happened to change my beliefs. Now this . . . Hell, I've got two sons I've got to put through school and I just . . ." His voice trailed off.

He sat for a few more minutes, then, looking over the top of his glasses, said hoarsely, "Well, it looks like we're licked. The way it stands now, we're to go ahead and prepare the data and other things for the graphic presentation in the report, and when we're finished, someone upstairs will actually write the report.

"After all," he continued, "we're just drawing some curves, and what happens to them after they leave here, well, we're not responsible for that."

He was trying to persuade himself that as long as we were concerned with only one part of the puzzle and didn't see the completed picture, we really weren't doing anything wrong. He didn't believe what he was saying, and he knew I didn't believe it either. It was an embarrassing and shameful moment for both of us.

I wasn't at all satisfied with the situation and decided that I too would discuss the matter with Russell Line, the senior executive in our section.

Tall, powerfully built, his teeth flashing white, his face

tanned to a coffee-brown by a daily stint with a sun lamp, Line looked and acted every inch the executive. He was a crossword-puzzle enthusiast and an ardent golfer, and though he had lived in Troy only a short time, he had been accepted into the Troy Country Club and made an official of the golf committee. He had been transferred from the Akron offices some two years previously, and an air of mystery surrounded him. Some office gossips figured he had been sent to Troy as the result of some sort of demotion. Others speculated that since the present general manager of the Troy plant was due shortly for retirement, Line had been transferred to Troy to assume that job and was merely occupying his present position to "get the feel of things." Whatever the case, he commanded great respect and had come to be well liked by those of us who worked under him.

He listened sympathetically while I explained how I felt about the A7D situation, and when I had finished, he asked me what I wanted him to do about it. I said that as employees of the Goodrich Company we had a responsibility to protect the company and its reputation if at all possible. I said I was certain that officers on the corporate level would never knowingly allow such tactics as had been employed on the A7D.

"I agree with you," he remarked, "but I still want to know what you want me to do about it."

I suggested that in all probability the chief engineer at the Troy plant, H. C. "Bud" Sunderman, was unaware of the A7D problem and that he, Line, should tell him what was going on.

Line laughed, good-humoredly. "Sure, I could, but I'm not going to. Bud probably already knows about this thing

anyway, and if he doesn't, I'm sure not going to be the one to tell him."

"But why?"

"Because it's none of my business, and it's none of yours. I learned a long time ago not to worry about things over which I had no control. I have no control over this."

I wasn't satisfied with this answer, and I asked him if his conscience wouldn't bother him if, say, during flight tests on the brake, something should happen resulting in death or injury to the test pilot.

"Look," he said, becoming somewhat exasperated, "I just told you I have no control over this thing. Why should my conscience bother me?"

His voice took on a quiet, soothing tone as he continued. "You're just getting all upset over this thing for nothing. I just do as I'm told, and I'd advise you to do the same."

He had made his decision, and now I had to make mine.

I made no attempt to rationalize what I had been asked to do. It made no difference who would falsify which part of the report or whether the actual falsification would be by misleading numbers or misleading words. Whether by acts of commission or omission, all of us who contributed to the fraud would be guilty. The only question left for me to decide was whether or not I would become a party to the fraud.

Before coming to Goodrich in 1963, I had held a variety of jobs, each a little more pleasant, a little more rewarding than the last. At forty-two, with seven children, I had decided that the Goodrich Company would probably

be my "home" for the rest of my working life. The job paid well, it was pleasant and challenging, and the future looked reasonably bright. My wife and I had bought a home and we were ready to settle down into a comfortable, middle-age, middle-class rut. If I refused to take part in the A7D fraud, I would have to either resign or be fired. The report would be written by someone anyway, but I would have the satisfaction of knowing I had had no part in the matter. But bills aren't paid with personal satisfaction, nor house payments with ethical principles. I made my decision. The next morning, I telephoned Lawson and told him I was ready to begin on the qualification report.

In a few minutes, he was at my desk, ready to begin. Before we started, I asked him, "Do you realize what we are going to do?"

"Yeah," he replied bitterly, "we're going to screw LTV. And speaking of screwing," he continued, "I know now how a whore feels, because that's exactly what I've become, an engineering whore. I've sold myself. It's all I can do to look at myself in the mirror when I shave. I make me sick."

I was surprised at his vehemence. It was obvious that he too had done his share of soul-searching and didn't like what he had found. Somehow, though, the air seemed clearer after his outburst, and we began working on the report.

I had written dozens of qualification reports, and I knew what a "good" one looked like. Resorting to the actual test data only on occasion, Lawson and I proceeded to prepare page after page of elaborate, detailed engineering curves, charts, and test logs, which purported to show what had happened during the formal

qualification tests. Where temperatures were too high, we deliberately chopped them down a few hundred degrees, and where they were too low, we raised them to a value that would appear reasonable to the LTV and military engineers. Brake pressure, torque values, distances, times—everything of consequence was tailored to fit the occasion.

Occasionally, we would find that some test either hadn't been performed at all or had been conducted improperly. On those occasions, we "conducted" the test—successfully, of course—on paper.

For nearly a month we worked on the graphic presentation that would be a part of the report. Meanwhile, the fourteenth and final qualification attempt had been completed, and the brake, not unexpectedly, had failed again.

During that month, Lawson and I talked of little else except the enormity of what we were doing. The more involved we became in our work, the more apparent became our own culpability. We discussed such things as the Nuremberg trials and how they related to our guilt and complicity in the A7D situation. Lawson often expressed his opinion that the brake was downright dangerous and that, once on flight tests, "anything is liable to happen."

I saw his boss, John Warren, at least twice during that month and needled him about what we were doing. He didn't take the jibes too kindly but managed to laugh the situation off as "one of those things." One day I remarked that what we were doing amounted to fraud, and he pulled out an engineering handbook and turned to a section on laws as they related to the engineering profession.

He read the definition of fraud aloud, then said, "Well, technically I don't think what we're doing can be called

fraud. I'll admit it's not right, but it's just one of those things. We're just kinda caught in the middle. About all I can tell you is, Do like I'm doing. Make copies of everything and put them in your SYA file."

"What's an 'SYA' file?" I asked.

"That's a 'save your ass' file." He laughed.

Although I hadn't known it was called that, I had been keeping an SYA file since the beginning of the A7D fiasco. I had made a copy of every scrap of paper connected even remotely with the A7D and had even had copies of 16mm movies that had been made during some of the simulated stops. Lawson, too, had an SYA file, and we both maintained them for one reason: Should the true state of events on the A7D ever be questioned, we wanted to have access to a complete set of factual data. We were afraid that should the question ever come up, the test data might accidentally be "lost."

We finished our work on the graphic portion of the report around the first of June. Altogether, we had prepared nearly two hundred pages of data, containing dozens of deliberate falsifications and misrepresentations. I delivered the data to Gretzinger, who said he had been instructed to deliver it personally to the chief engineer, Bud Sunderman, who in turn would assign someone in the engineering department to complete the written portion of the report. He gathered the bundle of data and left the office. Within minutes, he was back with the data, his face white with anger.

"That damned Sink's beat me to it," he said furiously. "He's already talked to Bud about this, and now Sunderman says no one in the engineering department has time to write the report. He wants us to do it, and I told him we couldn't."

The words had barely left his mouth when Russell Line burst in the door. "What the hell's all the fuss about this damned report?" he demanded loudly.

Patiently, Gretzinger explained. "There's no fuss. Sunderman just told me that we'd have to write the report down here, and I said we couldn't. Russ," he went on, "I've told you before that we weren't going to write the report. I made my position clear on that a long time ago."

Line shut him up with a wave of his hand and, turning to me, bellowed, "I'm getting sick and tired of hearing about this damned report. Now, write the goddam thing and shut up about it!" He slammed out of the office.

Gretzinger and I just sat for a few seconds looking at each other. Then he spoke.

"Well, I guess he's made it pretty clear, hasn't he? We can either write the thing or quit. You know, what we should have done was quit a long time ago. Now, it's too late."

Somehow, I wasn't at all surprised at this turn of events, and it didn't really make that much difference. As far as I was concerned, we were all up to our necks in the thing anyway, and writing the narrative portion of the report couldn't make me any more guilty than I already felt myself to be.

Still, Line's order came as something of a shock. All the time Lawson and I were working on the report, I felt, deep down, that somewhere, somehow, something would come along and the whole thing would blow over. But Russell Line had crushed that hope. The report was actually going to be issued. Intelligent, law-abiding officials of B. F. Goodrich, one of the oldest and most respected of American corporations, were actually going to deliver to a customer a product that was known to be defective and

dangerous and which could very possibly cause death or serious injury.

Within two days, I had completed the narrative, or written portion of the report. As a final sop to my own self-respect, in the conclusion of the report I wrote, "The B. F. Goodrich P/N 2-1162-3 brake assembly does not meet the intent or the requirements of the applicable specification documents and therefore is not qualified."

This was a meaningless gesture, since I knew that this would certainly be changed when the report went through the final typing process. Sure enough, when the report was published, the negative conclusion had been made positive.

One final and significant incident occurred just before publication.

Qualification reports always bear the signature of the person who has prepared them. I refused to sign the report, as did Lawson. Warren was later asked to sign the report. He replied that he would "when I receive a signed statement from Bob Sink ordering me to sign it."

The engineering secretary who was delegated the responsibility of "dogging" the report through publication, told me later that after I, Lawson, and Warren had all refused to sign the report, she had asked Sink if he would sign. He replied, "On something of this nature, I don't think a signature is really needed."

On June 5, 1968, the report was officially published and copies were delivered in person to the Air Force and LTV. Within a week, flight tests were begun at Edwards Air Force Base in California. Searle Lawson was sent to California as Goodrich's representative. Within approximately

two weeks, he returned because some rather unusual incidents during the tests had caused them to be canceled.

His face was grim as he related stories of several near crashes during landings—caused by brake troubles. He told me about one incident in which, upon landing, one brake was literally welded together by the intense heat developed during the test stop. The wheel locked, and the plane skidded for nearly 1500 feet before coming to a halt. The plane was jacked up and the wheel removed. The fused parts within the brake had to be pried apart.

Lawson had returned to Troy from California that same day, and that evening, he and others of the Goodrich engineering department left for Dallas for a high-level conference with LTV.

That evening I left work early and went to see my attorney. After I told him the story, he advised that, while I was probably not actually guilty of fraud, I was certainly part of a conspiracy to defraud. He advised me to go to the Federal Bureau of Investigation and offered to arrange an appointment. The following week he took me to the Dayton office of the FBI, and after I had been warned that I would not be immune from prosecution, I disclosed the A7D matter to one of the agents. The agent told me to say nothing about the episode to anyone and to report any further incident to him. He said he would forward the story to his superiors in Washington.

A few days later, Lawson returned from the conference in Dallas and said that the Air Force, which had previously approved the qualification report, had suddenly rescinded that approval and was demanding to see some of the raw test data taken during the tests. I gathered that the FBI had passed the word.

Omitting any reference to the FBI, I told Lawson I had been to an attorney and that we were probably guilty of conspiracy.

"Can you get me an appointment with your attorney?" he asked. Within a week, he had been to the FBI and told them of his part in the mess. He too was advised to say nothing but to keep on the job reporting any new development.

Naturally, with the rescinding of Air Force approval and the demand to see raw test data, Goodrich officials were in a panic. A conference was called for July 27, a Saturday morning affair at which Lawson, Sink, Warren and myself were present. We met in a tiny conference room in the deserted engineering department. Lawson and I, by now openly hostile to Warren and Sink, ranged ourselves on one side of the conference table while Warren sat on the other side. Sink, chairing the meeting, paced slowly in front of a blackboard, puffing furiously on a pipe.

The meeting was called, Sink began, "to see where we stand on the A7D." What we were going to do, he said, was to "level" with LTV and tell them the "whole truth" about the A7D. "After all," he said, "they're in this thing with us, and they have the right to know how matters stand."

"In other words," I asked, "we're going to tell them the truth?"

"That's right," he replied. "We're going to level with them and let them handle the ball from there."

"There's one thing I don't quite understand," I interjected. "Isn't it going to be pretty hard for us to admit to them that we've lied?"

"Now, wait a minute," he said angrily. "Let's don't go off half-cocked on this thing. It's not a matter of lying. We've just interpreted the information the way we felt it should be."

"I don't know what you call it," I replied, "but to me it's lying, and it's going to be damned hard to confess to them that we've been lying all along."

He became very agitated at this and repeated his "We're not lying," adding, "I don't like this sort of talk."

I dropped the matter at this point, and he began discussing the various discrepancies in the report.

We broke for lunch, and afterward, I came back to the plant to find Sink sitting alone at his desk, waiting to resume the meeting. He called me over and said he wanted to apologize for his outburst that morning. "This thing has kind of gotten me down," he confessed, "and I think you've got the wrong picture. I don't think you really understand everything about this."

Perhaps so, I conceded, but it seemed to me that if we had already told LTV one thing and then had to tell them another, changing our story completely, we would have to admit we were lying.

"No," he explained patiently, "we're not really lying. All we were doing was interpreting the figures the way we knew they should be. We were just exercising engineering license."

During the afternoon session, we marked some forty-three discrepant points in the report: forty-three points that LTV would surely spot as occasions where we had exercised "engineering license."

After Sink listed those points on the blackboard, we discussed each one individually. As each point came up,

Sink would explain that it was probably "too minor to bother about," or that perhaps it "wouldn't be wise to open that can of worms," or that maybe this was a point that "LTV just wouldn't understand." When the meeting was over, it had been decided that only three points were "worth mentioning."

Similar conferences were held during August and September, and the summer was punctuated with frequent treks between Dallas and Troy, and demands by the Air Force to see the raw test data. Tempers were short and matters seemed to grow worse.

Finally, early in October 1968, Lawson submitted his resignation, to take effect on October 25. On October 18, I submitted my own resignation, to take effect on November 1. In my resignation, addressed to Russell Line, I cited the A7D report and stated: "As you are aware, this report contained numerous deliberate and willful misrepresentations which, according to legal counsel, constitute fraud and expose both myself and others to criminal charges of conspiracy to defraud . . . The events of the past seven months have created an atmosphere of deceit and distrust in which it is impossible to work . . ."

On October 25, I received a sharp summons to the office of Bud Sunderman. As chief engineer at the Troy plant, Sunderman was responsible for the entire engineering division. Tall and graying, impeccably dressed at all times, he was capable of producing a dazzling smile or a hearty chuckle or immoblizing his face into marble hardness, as the occasion required.

I faced the marble hardness when I reached his office. He motioned me to a chair. "I have your resignation here," he snapped, "and I must say you have made some rather

shocking, I might even say irresponsible, charges. This is very serious."

Before I could reply, he was demanding an explanation. "I want to know exactly what the fraud is in connection with the A7D and how you can dare accuse this company of such a thing!"

I started to tell some of the things that had happened during the testing, but he shut me off saying, "There's nothing wrong with anything we've done here. You aren't aware of all the things that have been going on behind the scenes. If you had known the true situation, you would never have made these charges." He said that in view of my apparent "disloyalty" he had decided to accept my resignation "right now," and said it would be better for all concerned if I left the plant immediately. As I got up to leave he asked me if I intended to "carry this thing further."

I answered simply, "Yes," to which he replied, "Suit yourself." Within twenty minutes, I had cleaned out my desk and left. Forty-eight hours later, the B. F. Goodrich Company recalled the qualification report and the four-disk brake, announcing that it would replace the brake with a new, improved, five-disk brake at no cost to LTV.

Ten months later, on August 13, 1969, I was the chief government witness at a hearing conducted before Senator William Proxmire's Economy in Government Subcommittee of the Congress's Joint Economic Committee. I related the A7D story to the committee, and my testimony was supported by Searle Lawson, who followed me to the witness stand. Air Force officers also testified, as well as a four-man team from the General Accounting Office, which had conducted an investigation of the A7D brake

at the request of Senator Proxmire. Both Air Force and GAO investigators declared that the brake was dangerous and had not been tested properly.

Testifying for Goodrich was R. G. Jeter, vice-president and general counsel of the company, from the Akron headquarters. Representing the Troy plant was Robert Sink. These two denied any wrongdoing on the part of the Goodrich Company, despite expert testimony to the contrary by Air Force and GAO officials. Sink was quick to deny any connection with the writing of the report or of directing any falsifications, claiming to be on the West Coast at the time. John Warren was the man who supervised its writing, said Sink.

As for me, I was dismissed as a high-school graduate with no technical training, while Sink testified that Lawson was a young, inexperienced engineer. "We tried to give him guidance," Sink testified, "but he preferred to have his own convictions."

About changing the data and figures in the report, Sink said: "When you take data from several different sources, you have to rationalize among those data what is the true story. This is part of your engineering know-how." He admitted that changes had been made in the data, "but only to make them more consistent with the over-all picture of the data that is available."

Jeter pooh-poohed the suggestion that anything improper occurred, saying: "We have thirty-odd engineers at this plant . . . and I say to you that it is incredible that these men would stand idly by and see reports changed or falsified. . . . I mean you just do not have to do that working for anybody. . . . Just nobody does that."

The four-hour hearing adjourned with no real conclusion

reached by the committee. But, the following day the Department of Defense made sweeping changes in its inspection, testing and reporting procedures. A spokesman for the DOD said the changes were a result of the Goodrich episode.

The A7D is now in service, sporting a Goodrich-made five-disk brake, a brake that works very well, I'm told. Business at the Goodrich plant is good. Lawson is now an engineer for LTV and has been assigned to the A7D project. And I am now a newspaper reporter.

At this writing, those remaining at Goodrich are still secure in the same positions, all except Russell Line and Robert Sink. Line has been rewarded with a promotion to production superintendent, a large step upward on the corporate ladder. As for Sink, he moved up into Line's old job.