

# Heads up!

John Pitts

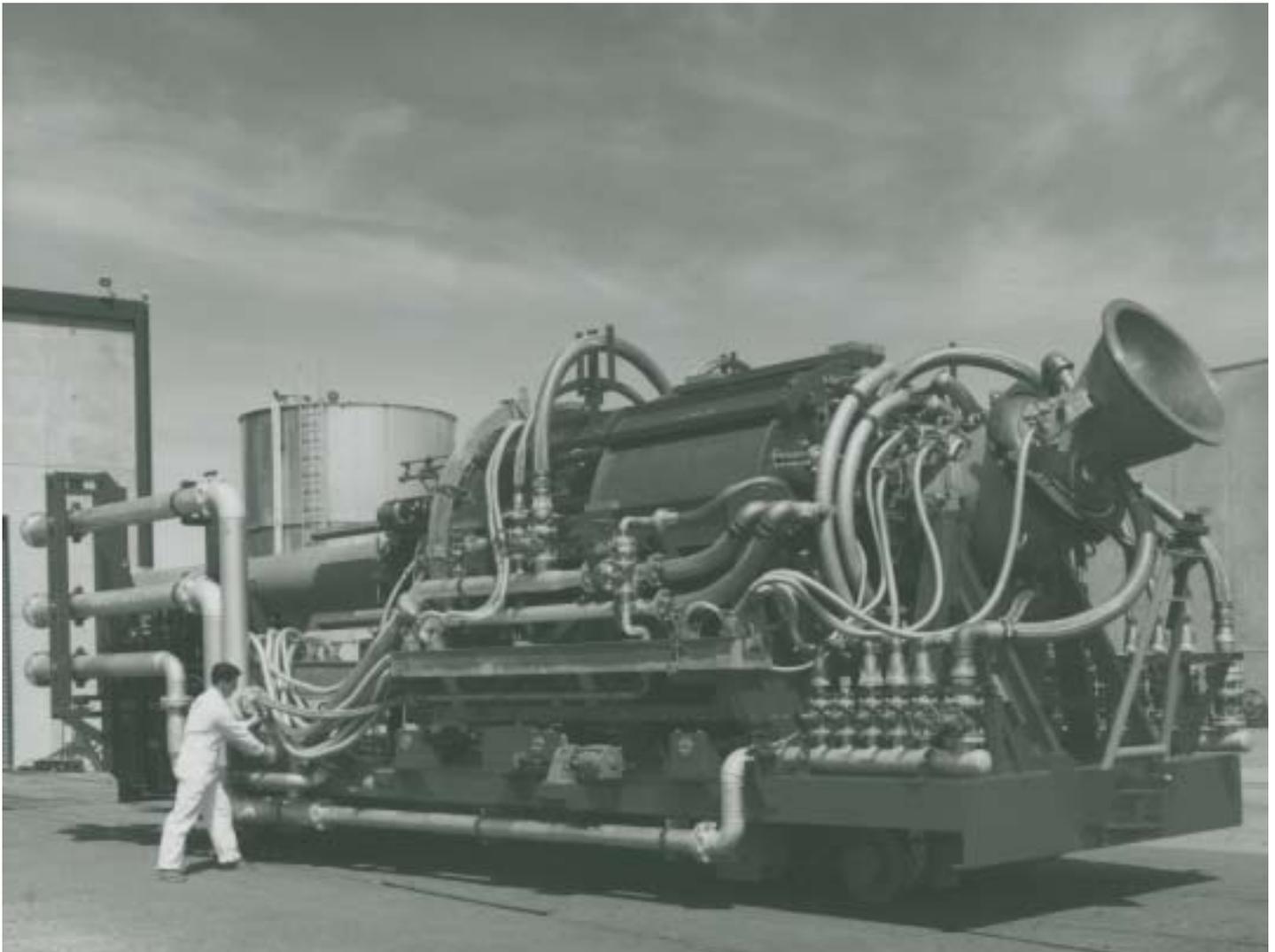
*During Project Pluto, scientists tested a flying nuclear reactor and ended up with a flying 600-pound nozzle.*

In 1959, I was assigned to the test vehicle group for the Pluto Program, which the Laboratory was getting ready to test at the Nevada Test Site. We were going to test a nuclear reactor that had a nozzle on it that's part of the ramjet engine. The nozzle was mounted upward at about a 45-degree angle. One of my bosses and I went out to watch a preliminary test where high-pressure air was forced through the engine before the reactor was installed. For safety purposes, we stood downstream of the engine and a couple hundred meters away. The engine started up, and we heard the roar. We were really kind of excited and then—pop! Well, the nozzle, which weighed 600 pounds, flew up in the air like a football, end over end, for about 300 or 400 feet

and landed in the dirt. After several expletives, I looked at my partners and said, "I can't believe this."

We walked over to this nozzle, and if it was damaged at all, it was just a scratch. We found that the clamp that held the nozzle on had actually broken. After some analysis, we found that the clamp was not well designed for stress and the metal was bad.

Now, one of the advantages of the Lab is that if you're not trained in a specific area, there are plenty of people around who are. I asked some people how to rectify this fault. Within a couple months, we had a better design, and the metallurgist made recommendations for changing the metal. When we tested it again with a new clamp, everything worked, and in fact, the design earned a lot of awards, of which we were really proud. It just goes to show that when a failure occurs, you can learn from the failure, come back, and make it better.



Tory II reactor for Project Pluto. The cone-shaped nozzle on the right is the object in Pitts's story.

# The Best of Intentions

Gary Higgins

From *Management Newsletter*  
article written by Carol Gerich



Gary Higgins.

*This bunch of gee-whiz physicists and chemists discovered moon-lighting as plutonium miners doesn't pay.*

There were four of us who went plutonium mining: Dale Nielsen, Scott Bybee, Jim Olsen and myself. We were all severely annoyed at the cost that the Lab was charged for a gram of plutonium. And so, being frugal, we thought it would behoove us to scrape up all the leavings after doing an experiment, and return them for credit. Because of the accountability rules, you had to account for every single gram.

We did not really understand the principles of accounting. Oh, it was easy to show on paper that we would show a great profit. Because, at most, what could it take? Several months of time, and at our salaries, that would be a few thousand dollars at the outside.

Since we were charged several million dollars for the total amount of material expended in the experiment, we could afford to build the equivalent of tethered diving suits, or space suits if you like, so we would have absolutely no contact with the environment. When we put them on, it was just as if we were in deep space. It was all set: we would have complete communication among ourselves and with the outside world, and a tape recorder to record what happened in case the roof fell in on us.

So, here we were, a bunch of gee-whiz farmer-physicists and chemists who were headed back to recover this valuable stuff from something like 500 or

600 feet inside the mountain. Scott, who had radiation monitors draped all over him, was to be the safety man. Dale and Jim between them brought two shop vacuums, and I had the communications line and power cords.

We had four or five empty barrels that were fiberboard drums. The shop vacuums fit onto the top of those. In principle, we were going to fill as many as we needed, and then we would put the lids on the drums, put the bands on, and put a piece of tape around that. We'd roll them out ahead of us as

we left, leaving behind the vacuums.

But we had not anticipated that it would be so black in the shot room, that even with our lights on we couldn't see anything. We could see each other, but we couldn't see the wall. It was so sooty that the light didn't reflect. On top of that, there wasn't much room. That whole room was about 10 feet square, and with four people in these bulky suits that were inflated by the air pressure and the fiberboard drums, it was hard to stay out of each other's way. Eventually, the cords for the vacuum and the telephone lines got into an inextricable web. The original plan was that we would vacuum the ceiling, then the walls and then the floor.

After looking at the ceiling and the walls, our decision was that we'd just get all the stuff that was on the floor and in the corners and forget the rest of it.

A few days later, I got a phone call from Dale, and he said, "Guess what? We recovered a lot of stuff in there. There seems to be something like a quarter of a kilogram."

"Well, Dale, you should send that right back to Oak Ridge; they've got the facility to recover all that good stuff." And I thought, "Wow, we really paid for the experiment!"

About 9 months later, I was at the test site in conjunction with some other work, and Dale told me, "By the way, we just got the word

back from Oak Ridge."

"Great," I said, "How much did we make?"

He said, "They sent us a bill, for \$273,000."

I said, "A bill? No, no. What about—where's our credit?"

"What do you mean, credit? They don't pay out; they only pay in. We got credit with the accountants for the source fissionable material and that went back on our books, as a credit, against the other source fissionable materials. But the reprocessing cost was \$273,000, and they want to know what account they're going to be paid from."

**"We were all severely annoyed at the cost that the Lab was charged for a gram of plutonium."**