

Now we have made two significant improvements to our game. And there hasn't been an accident in months. The employees are happy with the system, and cooperating very nicely.

But the manager of public relations and employee unrest, who was given the responsibility for this program by the board of directors, senses that something is wrong. Someone is fooling with the foolproof system he devised and presented to the board.

How could imbeciles who have never before seen such a game, students of antique administrative procedures, dare to question his judgement? He demands that the game go on, as he had specified, and that those who challenge the rules be silenced before they alarm all the employees and undermine faith in the program.

His immediate reaction is to mount a public relations campaign. Funds are short, but then there's the money he had set aside to fix the open elevator shaft. He issues sweeping assurances that the system is 100% safe. He musters his entire ten-man staff, previously occupied in preparing convenient "summaries" of essential technical reports for the board (minus any critical comments by outside experts).

His first announcement is that he has been working on certain changes in the rules which he determined were necessary. These improvements would already be in existence if the troublesome employees would "get off his back."

But then comes a voice from the outer world. The wives of some of the disgruntled employees have contacted the Society for Prevention of Cruelty to Commuters. The Society levels the outrageous charge that the game is dangerous. It has no independent fail-safe feature. Management should at least provide the runners with a flashlight while traversing the darkened corridor, and possibly consider a gate across the open elevator shaft, they say.

While the board was willing to consider reasonable suggestions from within the company, they reeled at the suggestions from foreigners. They lined up solidly behind their manager of public relations and employee unrest. He in turn set the tone for their public response: "It is an objective and high purpose of this employee improvement program that employees, in addition to being forced to move about once a day, will also be emotionally stressed. We cannot take the 'great leap forward' if we remove all concern for the infallibility of our safety system by resorting to

orthodox procedures which, aside from being visually reassuring, are only occasionally necessary."

Two new members of the board attempt to ask questions about reported incidents wherein the guard was required to restrain impatient runners. Their questions are drowned out by a hail of comments from older members of the board who point out that they had agreed with the managers' previous decisions and plans. The manager nods, "Yes sir, you're absolutely right, sir."

The board decides that the only proper display of confidence is to announce that the full program will be initiated on schedule. To accommodate all employees, multiple runners will traverse the course at the same time.

Management, however, will consider all suggested changes to the rules to determine if there are any that were not already anticipated by the staff.

Workmen installing the equipment on the tenth floor heard about the controversy that was developing as initial trials of the game were taking place. Three engineers had observed major deficiencies in the message clerks' educational backgrounds, which indicated that the clerks might not be able to reliably communicate with runners in the corridor under hazardous conditions. They had already warned management about nonexistent progress reports and test reports from the installers of the critical telephone lines between tenth-floor message clerks and the downstairs operator.

In fact, the Local Station switchboard had just been delivered in pieces. But another year would be required to check it out and verify proper operation.

The engineers were very concerned about what they were observing. Their past experience told them that the game was dangerous with the present crew and status of equipment. They decided to prepare a report for the board.

The board asked management to respond to the engineer's report. Management complained that the report could not be legally placed on the board's agenda since neither the engineers nor the board had asked management for approval to discuss such matters.

The board agreed. The engineers were fired. The game trials continued.

Two weeks later an unfortunate event took place. Old Charlie Gibbons, a maintenance employee plunged down the elevator shaft. He had been chosen as one of the test runners for the game trials on the tenth floor.

Normally, each test runner was given a thorough physical examination before being subjected to the game. But they were in a hurry that morning. A state safety inspector would be watching the trials that day, and they were short of runners. No one thought to check Charlie's hearing aid.

You see, Charlie had learned over the years that the corporate world was not a bad place--if you pay no attention to the people. He always arrived at work with his hearing aid turned down. The board of inquiry would later determine, on the basis of unchallenged testimony from the design engineers, that a "crystal" in Charlie's hearing aid was improperly mounted in the hearing aid circuit, thereby preventing Charlie from hearing the speed control messages which most certainly were offered. Furthermore, the maddening

sounds generated in his ear by the faulty circuit so disturbed his on-board electronics that he physically overcame the best efforts of the guard to check his crazed behavior.

The faulty crystal was recovered, intact, from the hearing-aid electronics package, which was found safely imbedded in six inches of concrete in the basement floor.

You may not find my hearing-aid analogy very funny. You shouldn't. This is the type of communication scheme BART now has between Local Stations and trains on the track: a whisper command system that requires a delicate hearing-aid in each train. You would agree that this is a tender description of the Westinghouse system if only you knew the failure characteristics of this scheme, as compared to the alternatives which most certainly would have been selected by the fathers of the "space-age" technology you bought, unseen and untested.

Meanwhile, the employees are getting restless. The word has gotten out. The game was never proven safe before it was selected as they had been led to believe.

After all, the United States government Department of Levitation had provided the company with two million dollars for research and testing of new games for employee conditioning. Hundreds of companies were considering similar programs, and the first game in successful operation could easily become a prototype for all others.

But, alas, it now turns out that all games tested and found acceptable over a two year period were rejected in favor of an idea which caught the manager's fancy at the last minute. The engineering department was encouraged to draft appropriate cost-justifications for selecting the new idea.

The employees, now better informed as to the origin of the game, organize a committee of elders who have survived similar games under real-life conditions. The committee soon recognizes the necessity of devising fail-safe procedures which would not require any noticeable changes in the rules adopted by management. To do otherwise would require intolerable delays in the program and very likely incur the wrath of the board. Essential employee benefits had already been delayed because of the attention given to the employee improvement program problems.

Gradually, over the period of a few minutes serious consideration of the requirements, the committee developed the concept that the only way was for each runner to protect himself, independent of the resources provided by the management.

They recalled the "whistle" technique for improving runner detection, (which management was now testing). Why not use the same scheme so that runners can notify each other of their presence in the corridor? This would provide protection against collision, independent of the commands given to each runner by the clerks.

Suddenly, every employee was practicing a low, steady whistle. The object was to whistle just loud enough to be heard within ten feet, but not loud enough so as to alarm other runners far away. But they still whistled very loudly in each clerk's telephone when picking up their instruction while going down the corridor. No reason not to cooperate with management's system--as long as it's working.

Finally, somebody got to the guard at the open elevator shaft. For a small fee he agreed to whistle softly at all times. Now the independent fail-safe system was complete. Indeed, the routine management system could not even deliberately command runners into collision or down the shaft.

And, we didn't have to change their system after all. Yes, it took a lot of cooperation to make the fail-safe work, but much less than what management was spending trying to justify what didn't work by itself.

It just so happens that there are ways to install a similar fail-safe anti-collision system on the BART trains and track. A small part of 40 million dollars two years ago would have it in operation now. And somebody on your staff knew about it.

The requirement can be stated simply as follows: We want a signal which precedes and follows each train, no matter where the train is on the tracks. This signal extends in front and behind the train only a fixed distance, say two thousand feet. We call this signal surrounding the train the "buffer."

Such a signal is difficult to achieve with normal radio waves or light beams, since they are difficult to contain or control to meet the fixed distance requirement along the tracks, which may be curved or concealed by tunnels.

However, we have the track itself. It is a conductor of electrical signals. The only problem is that Westinghouse is now using the tracks for their tender speed control signals. So we can't disturb them.

But, wait a minute. There is another rail. The third rail, or power rail. It is also a continuous conductor which connects all trains (except for a few minor breaks which we can fix up appropriately).

Fine.

But the trick is to get a strong signal from each train which only goes a fixed distance down the tracks and doesn't disturb all other trains at proper distances away.

This has been done for other applications. It can be done for BART. You have all the tools required--lying idle right now. And this is the only "Great Leap Forward" in train control that the transit industry has been waiting for: a foolproof anti-collision system independent of track-side equipment.

But even if BART must stop short of what it should have had for the money spent, you'll find that the other improvements discovered in the game will enhance your chances for success.

NEXT EPISODE:
Commuters Conspire
To Sneak a Signal
on the Third Rail