



Grassroots Safety Culture: The Lawrence Livermore Labs Story

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The safety culture of an organization can be improved upon through the involvement of the facility workers. In 1990, the plant engineering department at the Lawrence Livermore National Laboratories developed a grassroots safety culture. The cultural change and improvements from this worker-driven program have been far greater than expected. Workers' compensation costs have been reduced along with injuries and lost workdays. The program became so successful that it has blossomed into an annual safety conference and has attracted attendees from major corporations throughout the United States.

It is as true now as it was in Thoreau's day, that if you build a better mousetrap, the world will beat a path to your door. This has certainly proven to be the case at the Lawrence Livermore National Laboratories (LLNL), where a group of hourly workers have developed a grassroots safety culture process that has, through its merits alone, attracted the attention of the world. What began in 1990 as a homegrown effort to improve the safety performance in the maintenance and operations group at LLNL has become a virtual institution, with an annual national conference, a road show, and even a web site.

Their first national conference was held just down the road from Lawrence Livermore, California primarily for Department of Energy (DOE) people from various facilities. Since then, the program has broadened to include representatives from other government agencies and private enterprise, and the annual conference (they are working on their sixth) moves to various sites around the country. At these meetings, line workers, managers, and safety professionals meet and exchange ideas on how to promote safety through the use of grassroots-

driven, safety culture change. This has led to a proliferation of similar initiatives, with workers taking on a great deal of the responsibility for their own workplace health and safety, and that, in turn, has resulted in a marked reduction in accidents and injuries.

The story of how this mousetrap was designed and how it works is instructive. What the original core group of workers learned about safety and their role in managing it can be applied in part, or whole, in almost any industrial environment. Some would say it is the safety management model of the future—at least until someone comes along and builds something better.

Humble Beginnings

The impetus for safety culture change can come from any of four sources or, in some instances, a combination: (1) in response to a significant emotional event, i.e. a major accident; (2) from safety professionals; (3) top-down; or, (4) bottom-up. The bottom-up, or grassroots-driven, approach was the one taken at LLNL's maintenance and operations department, albeit with total management support. The idea was born on the shop floor nearly 10 years ago and there it has flourished. The grassroots safety effort has never lost sight of its roots, its spirit, nor its purpose.

The plant engineering department at Lawrence Livermore is comprised of approximately 1,100 people, including a maintenance and operations department of 700 craftspeople in 14 different trades, including carpenters, plumbers, electricians, mechanics, welders, custodians, pipe fitters, and metal workers. These are people who have superior mechanical aptitude, are good with their hands, use common sense, and are constantly devising new pieces of equipment to solve unique challenges. Who better to build a better mousetrap?

But by 1990, safety was still a major problem. Guards were installed, tools were fixed, problems were solved, but the overall safety performance of the department had not improved substantially. Members of the department's employee safety committee were frustrated. Jerry Morgan, a welder who had been head of the safety committee since 1983 recalls their dilemma: "We were plugging leaks, but new ones would appear. It seemed like we were up to our necks all the time. We needed a new focus and a new energy."

Management was also frustrated by the lack of progress in their safety program. It is often the case that while management and employees are at loggerheads over many issues, when both sides recognize that a problem exists, that shared perception can become the foundation for a new safety culture. Management and Operations (M&O) department head Bernie Mattimore who, along with a group of supervisors, had been working with a team of culture change consultants for a few months had something of an epiphany. "Hard as it was to admit, I realized that for 25 to 30 years, however long I had been in this field, I have been concentrating on the wrong things when it came to safety. I had been working on correcting unsafe conditions, without giving much thought to unsafe acts. While our people used good equipment in a good environment, we weren't helping them to work safely. It was at that point that I knew we had to change the safety culture."

Mattimore brought the consultants in to speak to the safety committee and a strong connection was made. "They talked about us taking responsibility for our own safety program," says Morgan, "about the need to get more workers actively involved in the safety process, to build a more participatory, positive safety culture." What the consultants described was a long-term process, five to seven years, to bring about a complete safety culture change within their department.

The presentation struck a chord. It was as if the workers had been waiting for a cause they could believe in. After all, it was their own health and safety that was at stake. Why depend solely on a few overworked safety specialists to do something for them, when they had among their own membership the people who knew the work best, had many of the skills to devise solutions, and had the greatest self-interest in improving safety performance?

Members of the M&O Safety Committee were overwhelmingly in favor of trying this new approach, of refocusing their efforts on changing the safety culture of their environment instead of just fixing broken machine guards. They weren't sure exactly what was involved, but they were eager to find out.

Giving Up and Taking Up Responsibility

Switching to a grassroots, bottom-up safety process from a traditional top-down approach involves a nexus of issues (including resources, communication, structure, process, etc.), but the critical change is in the shift of responsibility and power from one party to another. M&O chief Mattimore, while maintaining ultimate responsibility for the safety performance of his large department, would have to give up day-to-day, detailed supervision. "It was hard to let go, very hard," he recalls. "You are used to being in charge, in control, and all that changes when you empower other people. It's still your neck on the line, but you are depending on others to save it and, literally, their own necks. When you think about it that way, in terms of life and limb, they have much more to lose than I do."

Empowerment is a word that is overused and often misused. It is not about titles and charters; it is about bestowing real decision-making power on individuals who previously had little or none. And with power comes responsibility. The M&O Safety Committee was gung ho about accepting responsibility for their own safety, but were they ready for it? It is not enough to want responsibility, you have to know what it means and accept it.

Fortunately, the safety committee included more than its share of natural leaders and gifted grassroots organizers-of the type that every political campaign, union movement, and revolution depend upon. These included Jerry Morgan, chairperson of the M&O Safety Committee and Robin Ladd, an electrician, chairperson of the Site-300 safety committee (a subgroup located at a remote testing facility), and Clay Pendley, sheet metal worker and former co-chair of the committee, who helped drive the process during its first crucial years. According to Morgan, "We knew it would involve more work and more responsibility. But we were no fly-by-night group. Many of our members had been on the safety committee for years. We saw a chance to change things, to make a difference, and we made up our minds to do it."

Starting Up

Rather than reorganize, committee members decided to work with the existing M&O Safety Committee and the existing structure. The culture change primarily required a change of focus and a shift in responsibility. First, however, it would be essential to gain the support of management and the support and cooperation of fellow workers.

Management support was, improbably, the easier to attain. At first, a number of co-workers were suspicious of the new arrangement and aimed pointed barbs at committee members. It took years to build credibility and win converts among this group of scoffers; on the other hand, management was willing partners from the outset. According to Mattimore, the idea of a safety culture change had a lot of appeal upstairs, employing as it did the skills, resources, and interests of workers as a way to supplement existing safety efforts. There seemed to be a tremendous amount of upside and very little downside. And the costs were reasonable: some time off for the safety committee members to pursue their new responsibilities, capital expenditures only for identified needs, and the extended services of the consultants to provide guidance in the culture change process.

The workers were grateful for this outside help. They recognized that this was a new area for them. As part of the plant engineering department, they were used to a more technical approach: identify a problem, then design and build a piece of equipment to fix it. They also had some experience with behavioral programs and training aimed at getting workers to work smarter. But they wanted to get down to the root of the problem, to change the whole outlook of people regarding what they were doing. They wanted to get them out of the passive mode, get them thinking about safety for themselves and their co-workers, having them step forward and make suggestions and say when things weren't right. And ultimately that was going to have to involve all 700 people

in the department-or as many as they could reach-and a radical culture change. And that was something they needed guidance to accomplish.

The core group hired the original consultants to conduct training sessions and seminars for both workers and managers. Committee members learned how to conduct effective team meetings, how to elicit safety concerns from their constituent craft areas, and how to tap supervisory and professional resources and support. After learning about the critical relationship among major accidents, minor accidents, and near misses, they embarked on a near miss reporting crusade that exceeded the consultants' best estimates by achieving a greater than 90% participation rate. The grassroots safety culture revolution had begun.

Power to the People

The key to the lasting success of any grassroots culture change, such as the one conceived at Lawrence Livermore, is empowering the workers-not just giving them the illusion of power. They cannot simply be appointed to committees that are then run by management. Their interest and participation will sour rapidly once they sense that they are doing management's bidding in another guise. In grassroots safety, committees have to have teeth, the power to change things, to get things done.

This doesn't mean that management has to give them a blank check, but it does involve giving them a powerful mandate, handing over responsibility for the everyday safety program. It may be scary, but the dividends can be enormous. At Lawrence Livermore, the M&O Safety Committee is made up entirely of workers, with one non-voting management representative sitting in on most meetings, which are open. Instead of passing suggestions up the chain of command for possible enactment, workers have the right and responsibility for researching the idea and seeing it through to completion. They even have their own budget, though the idea is to get the affected department or contractor to pay for or reimburse for any safety expenses.

Building Trust

In addition to more work and more responsibility, the new arrangement would require an elevated level of trust-on all sides. The safety committee had to trust management to give them the authority and the resources to do their work and management had to trust them to do the work well. Both sides had a lot of exposure and assumed a lot of risk. Committee members had their constituency, which was more than a little suspicious of the new arrangement, and management had the ever-vigilant eyes of senior management on them.

"My superiors made it abundantly clear whose backside was on the line," Mattimore says. "And I had more than one sleepless night over this issue."

At one point there was an accident involving a machine guard. The order came down from on high that all machine operations, cutting, grinding, etc., would be halted until a complete review of machine guarding was accomplished. Mattimore and his deputy decided that this might be a good issue around which to test the fledgling culture change process; so they decided to offer responsibility for the machine guard review to the grassroots safety committee, realizing fully that they would have to live with whatever the committee did or lose trust forever. The committee readily accepted.

This was on a Friday afternoon. Monday afternoon, Committee members came to Mattimore and told him they were all done. They had looked at all the machines, talked to all the people, and wherever they saw a problem, they had figured out a way to fix it.

Mattimore went up to the number two man at the lab, the one who had issued the original executive order and told him what had been done and that they were all set. "Are you sure?" "Yup, the safety committee says everything is fine." The man posited the theory that Mattimore might have lost his reason. He promised that there would be a high-level OSHA inspector in there in a few weeks and he would go over everything with a

fine-tooth comb. "Was Mattimore still sure?" "Yup," he said, swallowing hard. "Okay, it's your nether region on the line."

Mattimore did not pass the story on to the committee. If anything, he tried to act very confident, in spite of an unsettled stomach. The temptation was for his management team to go in there at night and check everything out. But they resisted. Instead, he simply went to the committee and, leaving out the part about anatomical threats, told them that there would be an OSHA inspector on site in a few weeks. "Do you still want to start up operations?" "Sure, no sweat."

So they did start up and a few weeks later, as promised, the OSHA inspector came in, looked at everything and took copious notes. It turned out he was so impressed that he recommended that the committee help other departments at Lawrence Livermore with their machine guards.

Everybody passed this difficult test, but it was not until nearly five years later that the committee learned that their managers' jobs had been on the line. According to Mattimore, "If we hadn't shown our trust in them, we would have lost an awful lot of ground. We had made the commitment and so we felt had to follow through."

Trust is earned incrementally, but it is also enhanced by this type of nerve-testing exercise. According to Mattimore, the solid performance of the grassroots safety committee had given him a measure of comfort and confidence, "But when your job is on the line, it can, nonetheless, require a small leap of faith."

Issues of trust also existed among other members of the organization. Particularly at the onset of the program, other workers showed suspicion of the new, seemingly cozy/chummy relationship between committee members and management. Mattimore's boss, Jan Cook, was the management representative at the monthly M&O Safety Committee meetings. The two parties were working together so closely that some co-workers accused committee members of being the puppets of management. The idea was that if no conflict and hostility existed, then the workers must have sold out.

Another problem was that in the beginning, lots of frivolous complaints and irrelevant issues were being funneled through the committee. The committee learned to screen these out or deal with the minor problems, solving them on the lowest possible level, and bringing only substantive issues to management, or assigning for further research and review. Likewise, they learned to redirect employee issues unrelated to safety. Because they were seen as having a pipeline to management, for instance, all kinds of complaints and personnel problems have been, and still are, brought to the committee; and so they carry out a secondary communication role.

Gradually, as people learned the true nature of the culture change revolution, as more workers participated in some facet of the process, and as more was accomplished to benefit the workers, they have come to realize the committee belongs to them and not to management, that the committee is of the workers, for the workers, and by the workers. And although the committee may have taken on some of the traditional roles and responsibilities of management and safety professionals, they have done it to protect the well-being of the worker-and they have been very successful at it. "Most workers now understand and appreciate what we have been doing," Ladd says. "There will always be a few skeptics, but that is something we can live with."

The relationship between safety professionals and workers has also improved as a result of the culture change process. Previously, workers saw the safety department as cops, coming around to mark them down for their mistakes; now it is much more of a partnership. "We'd see them coming and we would think we must have done something wrong," says Ladd. "Now we understand what they do and we appreciate their work. We also use them more. They are among the resource people who regularly attend committee meetings."

In addition to the regular voting membership, which consists of representatives from each of the crafts in the department, committee meetings are regularly attended by a couple of safety professionals, a member of the

environmental protection department, and a member of management. They are there to advise and answer questions and, sometimes, to take on assignments, whatever is appropriate.

Committee members are quick to point out that they have not taken the place of the traditional safety program, represented at Lawrence Livermore National Labs by the Hazards Control group, which administers all the various regulations that apply at the facility, complex regulations which few mortals actually comprehend. The workers constantly call upon hazards control to answer questions and interpret rules. "We don't claim to be safety professionals," says Morgan. "We've just taken on a major share of the responsibility."

A difficult situation still remains with regard to middle managers and supervisors, who sometimes got caught in the middle-or feel excluded-from the culture change process. Some prefer a process where requests and suggestions flow up and down the chain of command. This does not correspond at all with the culture change process wherein workers can take safety issues directly to the grassroots safety committee and the committee, made up entirely of workers, either handles these problems themselves or takes them up directly with management.

Ladd is sympathetic. "Many of these supervisors are people who have worked hard to raise themselves to the level that they now occupy. Sometimes, it can be more difficult for them to give up a measure of control than for senior managers. But we're working on it, trying to keep everyone informed and in the loop."

A Glimmer of Light

Although the workers of the M&O Department at the national lab were not trying to hide their light under a basket, neither were they looking for fame and recognition for their accomplishments. They had set out to improve their safety performance by bringing about a grassroots-driven, safety culture change, and they seemed to be accomplishing that. But they had no way of knowing for sure, because their mission did not include managing the numbers. "Our job was managing the people," says Ladd. "In the first few years, we actually had no idea how we were doing. People would ask, but we had nothing to give them. We finally had to go to the safety professionals to get some data."

The numbers proved they were getting results. By the third year of the process (they don't like calling it a program), accident rates in their department had been markedly reduced, with a decline in lost workdays from 455 to 265 and in restricted workdays from 372 to 42, and workers' compensation costs were down 80%, a savings of more than half a million dollars a year. Although they had been advised not to put much stock in numbers, particularly lagging indicators such as incident rates and recordables, in assessing the early success of a culture change initiative, they clearly had to be pleased.

Not keeping track of the numbers had probably been to their advantage. Culture change takes years to accomplish and looking for quick results can be discouraging. It is like going on a diet and weighing yourself every hour-losses may be minuscule and there can even be some back-sliding. It is easy to lose heart. You are better off changing your lifestyle-nutrition, exercise, sleep and stress-and letting the long-term results take care of themselves.

These excellent results did not go completely unnoticed. While the program had failed to expand or even attract much interest in other departments at Lawrence Livermore-including among the engineering and construction group in their own department-management appreciated their improved safety performance. When Tara O'Toole, M.D., M.P.H., Assistant Secretary of Environment, Safety and Health for the DOE, and the Department's top ESH officer, came to Lawrence Livermore on one of her periodic site visits and requested a meeting with a group of employees involved with safety, management steered her directly to the maintenance and operations grassroots safety committee.

Accompanied by the top brass at Lawrence Livermore, O'Toole set out for the meeting. At the door, she turned back her entourage, insisting that no members of management be present. Members of the safety committee told her that they didn't mind if the managers attended, that they were used to speaking their mind regardless of who was present, but she insisted. Like expectant fathers, the Lawrence Livermore brass paced outside the meeting room, waiting for O'Toole to emerge. What they expected to last 15 minutes went on for an hour and a half (two-and-a-half hours in one manager's memory). Naturally, the anxiety level among senior managers rose as the clock hands swept around. But they had no cause for concern; the workers did not slam management and O'Toole was extremely impressed with the grassroots safety leadership process they had developed. She was so impressed, in fact, that at the end of the meeting she suggested that the all-employee safety committee host a conference for representatives from other DOE sites, to help promote other grassroots-driven initiatives. Although they didn't know anything about organizing such an event, the workers promised to think about it.

When management heard about O'Toole's suggestion about hosting a conference, they immediately encouraged the worker committee to go ahead and do it—even though there wasn't a professional event planner among them. This demonstrates the kind of trust and confidence that management had developed in the capabilities of the committee members. And the committee accepted the challenge, which shows the kind of confidence they had developed in their own capabilities. But neither party quite realized how great a challenge awaited them.

The Safety Culture Revolution Workshop

The workers agreed to take responsibility for the event. Then they shrugged, looked at each other and asked, "What's a conference?" "How do we put one on?" Eventually, with some direction from the outside consultants, they rolled up their sleeves and set about to find out.

And so it was that a group of hourly workers, welders, electricians, custodians, etc., developed a conference for DOE managers, safety pros, and fellow workers from across the country. From scratch, they created "The First Safety Culture Revolution Through Employee Empowerment Workshop," sponsored by Lawrence Livermore National Laboratory and Energy Facility Contractors Group (EFCOG). Initially they envisioned a mini-conference, with about 50 attendees, but the response was so positive that they had trouble limiting the number. Fifty people quickly signed up, then 100; they finally had to cap attendance at 120.

Word of a good thing spreads quickly. In the end, there were not only people from other DOE facilities, there were also workers, managers, and safety professionals from more than 10 U.S. and Canadian companies, such as Southern California Edison, General Motors, United Airlines, and Canadian National Rail. All told, approximately 130 people attended the two-and-a-half-day meeting held at a hotel near the San Francisco Airport. The theme, naturally, was employee empowerment in the safety process. Presenters included members of the workers' safety committee, representatives from national safety groups, consultants, and DOE contractors.

The format of the conference was just as interesting as the theme and the content. Rather than have a standard dog-and-pony show, with a series of presentations to a more-or-less passive (and yawning) audience, organizers decided to use an unconventional format more reflective of their philosophy. They set up 12 round tables in a large hall, complete with flip-charts, and called the conference a workshop. The idea was to model and engage people in the kind of exchange which best represented the principles of culture change, i.e. openness, disclosure, and active participation.

This high-risk approach paid off; attendees got their juices running by brainstorming a number of topics, such as: envisioning a safety culture, delineating the driving forces for change, identifying barriers to change, approaches to building teamwork, and creating ideas for future workshops. In a small way, participants were experiencing the six stages of culture change. With flip-charts in hand, discussion groups then presented their ideas to the entire gathering. This unusual format promoted participation, peaked interest and changed attitudes forever.

The format, as well the topic of creating and sustaining a grassroots safety culture, also evinced a great deal of emotion from people. Before the conference was even over, there was a hue and cry about doing it again. "It was damn near a religious experience," observed one participant. The written comments of the attendees were also overwhelmingly positive, both about the first conference and about the idea of making it an annual event.

Spreading the Word

In spite of the tremendous amount of work involved in putting on a workshop of this magnitude, the grassroots safety committee agreed to direct future events. In order to give the conference a chance to become established, as well as to get some payback for the development efforts, the committee and management agreed to a five-year commitment. To relieve the Lawrence Livermore workers of some of the burden, other facilities would be responsible for hosting the actual event in their vicinity. Workshop II, in 1996, for example, was held in Cincinnati and hosted by FERMC0; Workshop III was held in Breckenridge, Colorado hosted by Rocky Flats; and Workshop IV in Kansas City hosted by Allied Signal in 1998. Although the overriding purpose was to promote safety culture revolution through employee empowerment, each conference also had its own more specific focus. Workshop II focused on "Getting There: Vision, Mechanics, Measurement" and was somewhat more traditional than the first year. A free-wheeling style was back in year three with a workshop entitled, "Can One Person Make a Difference?" And the theme of Workshop IV was "Partnering for Safety '98." Workshop V is now on the drawing board.

Each year, the M&O Safety Committee strives to make the conference different and interesting. Last year, for example, they did not even present their own case study, opting to let others talk about their experiences with grassroots safety culture. After all, the purpose is to exchange information and ideas, not to proselytize.

"We see it as a kind of watering hole," Morgan says, "where people can come each year, get together and exchange information and experiences. We are looking to learn as much as to teach. There's no way we think we have the monopoly on good ideas." In fact, some companies now send their grassroots safety team members back each year, to present their work, get recharged and carry home new learnings.

The population that attends the conference has evolved over the years. In the beginning, the workshops were dominated by managers and ESH professionals; now it has shifted to a worker majority. The committee found that interested facilities were more effective at starting grassroots safety culture efforts back home after sending a balanced core group of potential safety culture leaders to the annual conference. Typically, the committee recommends sending four people: two workers, one safety professional, and a manager champion.

The organizers have become so experienced and smooth, that they now even chair the event, standing up and introducing speakers and notables, moving comfortably among Washington bureaucrats, Fortune 100 company bigwigs, and super-educated professionals. Their learning curve has been as rapid as a surgeon's: see one, do one, teach one. From not knowing "even what a conference is," they now take pride in fostering the participation of others as panelists and presenters.

As an ongoing means of communication for conference participants and other browsers, the committee set up and maintains a web-site called "Safety Culture Revolution," at

<http://www.llnl.gov/pe/pe-esc/ESC-home.html>

Own Backyard

After a couple of years of national exposure, the grassroots safety effort finally attracted some attention in its own backyard. Other departments at Lawrence Livermore requested their own mini-conference for facility personnel; and who better to put on a conference than those by-now professional meeting planners, the grassroots safety team. The in-house conference was attended by 130 people from 16 departments at Lawrence

Livermore. A handful of these departments, with the help of the M&O Safety Committee, have already established their own grassroots safety committees and one, representing the Environmental Protection Department, presented at last year's national conference in Kansas City. And so it goes.

Other Venues

M&O Safety Committee members have been busy spreading the word at other venues beside their own annual conference. For four years, they presented at the National Safety Congress, drawing upwards of 200 people to their regular session. Afterwards, they also contributed their case study to a professional development seminar on grassroots safety leadership that is regularly offered.

With the full support of Lawrence Livermore management, committee leaders host and visit other DOE facilities and private companies each year. DOE sites include Allied Signal, EG&G Mound, FERMCO, Hanford, INEL, LLNL, Oak Ridge, Sandia, and Savannah River. Companies they have worked with include Allied Signal Aerospace, Pacific Gas & Electric, Lockheed Martin, Southern California Edison, Owens Corning, United Airlines, Harley Davidson, Cummins Diesel, Canadian National Rail, GM Saturn Corporation, Granite Construction, and Mothers Cookies.

Those who come to Lawrence Livermore on benchmarking visits from outside organizations are encouraged not only to meet with M&O Safety Committee members and management, but to tour the facility and talk to anyone they want to. Invariably, this provides positive feedback and adds immeasurably to the credibility of the grassroots process. One experienced safety consultant said, upon visiting, "For years, I've heard about culture change in safety. Up until now, I've only seen the menu. Today, I saw the meal."

Postscript

Celebrating its ninth birthday this year (1999), the grassroots safety culture change process at Lawrence Livermore is one of the oldest such experiments in the country. The transformation of the culture, which is estimated to take anywhere from three to seven years, is essentially complete. The current culture supports, encourages and rewards safe performance by workers in the M&O department. Still, Jerry Morgan and other safety change leaders feel that their job will never really be complete, that they are in a process of continuous improvement, always trying to raise consciousness, increase participation, and keep the ideal of safety fresh in the minds of all the workers at all times. As he states affirmatively, "We will only have reached our goal when there are zero injuries at the plant or at home."