

Vision, Values, Milestones: Paul O'Neill Starts Total Quality at Alcoa

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It is really quite impossible to be affirmative about anything which one refuses to question; one is doomed to remain inarticulate about anything which one hasn't by an act of the imagination made one's own.

—James Baldwin, *Notes of a Native Son*

In November of 1987, Paul H. O'Neill, the new Chairman of the Board and Chief Executive Officer of the Aluminum Company of America (Alcoa), appointed a task force of a dozen senior managers to explore the issue of quality management at Alcoa and report to him and the company's senior management Operating Committee with concrete recommendations for change. Over a period of about six months, this Quality Task Force and the Operating Committee labored first to identify the challenges and opportunities, and then to design and begin implementation of Alcoa's "Excellence through Quality" initiative. This is a somewhat personal account of the start-up of this new total quality management initiative at Alcoa.¹

Background

The forces that prompted and shaped "Excellence through Quality" are deeply rooted in Alcoa history. Alcoa is the largest aluminum company in the world with fiscal 1987 total revenues of \$7.8 billion dollars, shipments of 2.3 million metric tons of primary aluminum and fabricated aluminum products, and 55,000 employees. Alcoa was founded in Pittsburgh in 1888 by Charles Martin Hall, the inventor of the modern electrolytic aluminum smelting process, and was seeded with venture capital from the Mellon family. From its founding until 1948, when the U.S. Government forced

Alcoa to sell off some of its plants to emerging competitors, the company held a virtually complete national aluminum monopoly. Earlier, the company had been moving toward a global dominance in aluminum, but in 1928, under the stress of becoming truly multinational from its domestic base and culture, Alcoa divested its international holdings. These became Alcan, the second largest aluminum company in the world. Over its century plus of life, the company has had an enviable record of success and adaptability. Starting from scratch it created the processes, the products, and the markets for aluminum. Alcoa meant aluminum. Alcoa meant quality.

Yet by the early 1980s, many inside and outside the company believed that the aluminum industry was now mature and the outlook poor. The reduction of trade barriers under GATT had opened North America to competition on aluminum more successfully than had the earlier anti-trust maneuvers of the U.S. Government. Third world governments that held the principle sources of raw material became themselves manufacturers of primary aluminum, often at sharp subsidies. Aluminum, a precious metal when Alcoa was founded, had now become a commodity and the international supply, demand, and pricing system was out of Alcoa's or anyone's control. Another troubling trend was seen: exotic substitute materials appeared in the market.

In the 1982 Alcoa Annual Report, then Chairman W. H. Krome George observed these dilemmas and suggested that effective responses must imply very big changes in "the Aluminum Company." Shortly thereafter, in 1983, his successor, Charles W. Parry, articulated a new diversification strategy that would take Alcoa into the production and sales of the emerging materials that many feared would replace aluminum—highly engineered laminates, polymers, ceramics, composites, and the like. Alcoa would become "The Engineered Materials Company" and, according to this corporate vision, by the turn of the century more than half the company's revenues would be from non-aluminum products. To carry off this strategy Parry dramatically increased and re-focussed the company's research and development expenditures and embarked on a program of acquisitions.²

Only four short years later, apparently unimpressed with their Chairman's ability to clarify and execute his diversification strategy, the Alcoa Board of Directors in a quiet internal revolution requested Mr. Parry's early retirement. Thus, Paul H. O'Neill, then President of International Paper, became the new Alcoa Chairman and CEO in April 1987. In his introductory communications to employees, to the financial community, and to stockholders, this first ever outside CEO spoke about safety, about quality, and about the people of Alcoa as a valued resource. He also signalled a fundamental shift of strategy: Further business diversification would be put on hold while he concentrated on improving the performance results of the base business. It was back to aluminum basics.

The options available to O'Neill and Alcoa in pushing an agenda of improving the base aluminum business would be shaped by two facts about Alcoa and the industry. First, truly *fundamental* process change had not happened in the industry and appeared to be infeasible. The smelting of aluminum was still done by the century old Hall-Heroult electrolytic process (notwithstanding very substantial efforts by Alcoa and Alcan to make major smelting innovations in the 1970s and early 1980s). To be sure there had been a century of continual refinements, and by many measures Alcoa was still a world leader in aluminum process technology. Second, *revolutionary* new aluminum products did not appear to be coming along quickly either. Alcoa was no Hewlett-Packard or 3M, companies for which very significant percentages of current revenues come from products that did not exist 5 years ago. As of 1987 the last significant new product introduction was still the all aluminum beverage can that had been introduced twenty-two years earlier—by Alcoa. Again, this product had been refined over the two decades since its introduction and by 1987 accounted for about a third of Alcoa's aluminum revenues. Where was the next such innovation coming from? Perhaps it would be the aluminum intensive automobile that Alcoa was working towards?

Thus, it made sense that a back to the *base business strategy* would also mean a back to the *basics of the business strategy*. While serving as International Paper's President, Paul O'Neill had been an observer and participant in the significant total quality management initiative undertaken by IP between 1985 and his departure for Alcoa in April 1987. Despite millions of dollars invested, a well-thought-out plan, attractive icons on the walls, thousands of hours of training, and the energies of many dedicated individuals, the results at IP failed to match the private expectations or public promises of the program's initiators. Neither Paul O'Neill, nor any number of other observant and frustrated IP employees were able to get IP's quality program on track. Nevertheless, O'Neill was still convinced that quality could be made a central part of his strategy at Alcoa. "But," he said, "it has to produce real value." How would the Alcoa quality effort be different? What follows is the story of what Alcoa did and why.

The Task Force Starts Work

In November 1987, Paul O'Neill and C. Fred Fetterolf, Alcoa's President, jointly commissioned the Quality Task Force to undertake a study of quality management and to recommend a course of action to them and to the Operating Committee (the seven senior Alcoa officers who, since O'Neill's installation as CEO, increasingly acted as his cabinet in running the company).³ The 12-member Quality Task Force had six members of vice presidential rank and six members just one level below who were seen as

“up-and-comers.” As Alcoa was rather niggardly with the VP title—there were only 27 in the 55,000 employee company—this was a high horse-power group. The Quality Task Force Chair was the Vice President of Engineering, Thomas L. Carter.

At Paul O’Neill’s suggestion, Tom Carter called on me in December to organize a seminar on the statistical design of experiments for the Task Force. It became clear that focussing on such complex statistical material for this group of high level of executives at such an early stage in their explorations of quality management was premature. Together we formulated a new set of objectives for an initial quality *education* experience for the Task Force. We began early on to speak of education rather than *training* which connotes specific task oriented learning. The Task Force, at this stage of the total quality initiative, did not yet need specific skills. They needed to acquire information and *understanding* on which to make strategic choices.

Tom Carter voiced his perception of the needs: “What I’d like is that within 3 weeks the Task Force should have a more sound factual and experiential basis for understanding TQC, understanding what it could be at Alcoa, and understanding the potential impact on the company. I’d like them to have the beginnings of a plan for how to get there.” Then, in response to a question about the likely barriers, Carter ticked off, “They don’t know what they don’t know. They think it doesn’t apply to us, and that at Alcoa we’re different. They’ll fear a loss of power and autonomy. Lastly, in reality the Alcoa culture is not very fact-driven. Decisions are made around here on the basis of decibel level.”

We began by holding an intensive three-day introductory seminar away from the job site, Alcoa’s Pittsburgh Corporate Headquarters. The material was presented in a manner that encouraged critical consideration and evaluation, and assessment of relevance to the realities at Alcoa. From the outset and repeatedly throughout the sessions, we stressed two essential points. First, we stated: “Around the world companies like yours are at this very time convened in similar seminars, digesting similar ideas, and are evolving similar quality strategies and systems. There are no secrets in total quality. In rather short order, everyone will know the essentials of what needs to be done. Success will go to those who are superior at implementation—to those who *execute* well.” Second, “Diagnosis must precede and shape the specific actions and design to fit this company in this industry at this time. What are the specific organizational and performance problems at Alcoa for which total quality is an alleged solution? Any effective TQ design for Alcoa must be appropriate for the most important of these challenges, and must recognize this company’s history and culture!”

Day 1 was an overview of the best thinking in quality management circa 1988. To set the stage historically and philosophically, it started with a summary of the opening day of W. Edwards Deming’s now legendary 1950 Tokyo

lectures to senior Japanese industrial executives and scientists.⁴ Other material included various definitions of quality, the economic impact of quality and the concept of quality related costs, the strategies of prevention and continuous improvement, Juran's ideas on quality management implementation, and the philosophy and implementation of Kaizen in Japan.

After dinner on the first day, we performed Deming's famous red bead experiment. In this simulation, Dr. Deming illustrates the devastating impact of variation on managerial decision making through sampling beads from an urn. Red and white beads are mixed in the urn and the players sample beads by dipping a paddle into the urn. The white beads are acceptable production and the red beads are the defectives. Deming urges the employees (participants) to try not to produce red beads. Of course they can't—the red beads are already in the bowl. They are inherent in the system and try as one might red beads can't be avoided in the sampling. As the simulation proceeds, he harangues the workers, displays the data on an overhead projector and makes some telling points about "management by the numbers," and about the sources and solutions of quality problems. We played out the bead experiment with the Alcoa managers as the "willing workers" and with me as the "foreman," imitating Deming's unique style as closely as I could.⁵ I fired employees, rewarded the employee of the month, and threatened to close the plant. A run chart of the red bead "defect" data was plotted on an overhead projector as we proceeded.

However, we added a special twist to the red beads. Prior to the seminar, I had requested from Mr. Carter some Alcoa time series data on product quality, process reliability, sales, safety performance, and the like. I had plotted these Alcoa data on a scale identical to that used in plotting the red bead data. My Alcoa plots were done in two versions, one labelled and one not. After the bead drawing, I displayed the unlabelled versions one at a time on one overhead projector while the red bead data plot was projected simultaneously on another. The question was put to the participants: "Here are some data on an important Alcoa process, over there are the red bead data. What is the difference?" In most cases, it was indeed impossible to see what the differences were, if any. When the identity of the Alcoa plots was revealed, the room echoed to some soft gasps. These data were all important Alcoa performance measures and the similarity to the red bead data was apparent. Most telling was the plot of safety data, which pushed an Alcoa hot button. This plot showed Alcoa's safety performance was quite variable and not satisfactory. Yet according to the control limits, it was in "statistical control" and was not improving despite the company's long-standing safety program. It must be remarked that Alcoa was then, and is now, the best performer on safety in its industry. But Paul O'Neill was not content and he was targeting safety levels equal to those of Dupont, the U.S. national benchmark on industrial safety. But, to reach that level would require a reduction in the Alcoa serious injury rate by nearly a factor

of five. Here was an exhortation without much substance to the safety improvement program in place. The participants immediately saw the analogy between the Alcoa Corporate proclamations about improved safety performance and the exhortations of foreman Deming about “no red beads.”

All in all, the red bead experiment proved to be an “aha” experience that transcended ordinary classroom learning. Over the course of the next nine months, this experiment was repeated in quality awareness training sessions around the company with data specific to each business unit. It entered into Alcoa corporate folklore, and managers would spontaneously remark, “there go the red beads again” or “no red beads”—a testimony to the appropriateness of this part of the Deming philosophy. Almost immediately the Quality Task Force took onto itself the assignment of looking into safety at Alcoa from a statistical process control and Deming Plan-Do-Check-Act (PDCA) problem-solving cycle point of view. That hands-on work would prove an important part of the learning and maturation of the group on quality management.

On the morning of day 2 of the seminar we continued with an overview of statistical control and process capability ideas, and with an introduction to Japanese style implementing PDCA problem-solving process. After lunch, the focus shifted dramatically as Columbia Professor Mike Tushman put the *content* of total quality aside for a moment and began to work on the *process of changing* to total quality. He introduced a framework for problem diagnosis and problem solving at a macro organizational level and made a direct analogy to our earlier discussions of the Deming style of analysis on the factory floor.⁶ It was PDCA all over again, and we reminded the Task Force that though Deming’s Cycle was first employed on the factory floor, by 1967 the Toyota Board of Directors had adopted it for analysis of all corporate problems at all levels. Later, in a case study of Toyota Machine Tool’s march towards the Deming Prize they would see how the master planning process employed was an elaborate PDCA Cycle. The afternoon’s work dealt with a number of case studies, and in each one, as soon as the main problem symptoms were displayed, these Alcoans would leap into action and propose solutions with little orderly analysis. When this tendency was contrasted to the orderly (and apparently slower) Deming PDCA cycle, the Task Force members reminded themselves, and us, of the Alcoa corporate slogan “We can’t wait for tomorrow!” Our own joking rejoinder was to describe their actual implementation of the Alcoa slogan with an alternative: “Ready! Fire! Aim!” Along with “no red beads” this phrase would also enter the new Alcoa lexicon.

On the first evening, discontent and uneasiness among many Task Force members became apparent. It surfaced that perhaps a majority of the Task Force was uncertain about their mission, about why *they* had been chosen, and about what was actually expected of them. The day’s course materials seemed quite interesting, most averred, but “to what purpose? why are we

here?" O'Neill and Fetterolf joined the Task Force on the second evening for dinner. They were alerted to the emergent issue and encouraged to help get the Task Force (back) on the rails. The dozen Task Force members sat around the outside of a large U-shaped table and the Chairman and President took chairs in the opening of the U. Mr. O'Neill started rather softly, "Safety is my number one priority with quality right behind it . . . all-consuming quality. Quality in the broadest possible sense. I'm asking this group to help us think about it and shape what we as a company do about quality. Tell us candidly what we need to know so that together we can make quality a reality—and quickly. I want our relationship to be interactive." After about 10 minutes of remarks along these lines, President Fred Fetterolf spoke, "I fear what will happen if we don't do something dramatic on costs. Experts say that 25% cost reduction is available through quality. That seems credible to me . . . I became convicted of it on the Japanese trip.⁷ It is an absolute necessity. We are getting a better picture of what is good and bad manufacturing. I'm concerned about the unevenness of commitment on quality across the company, about the lack of common language and understanding. Tell us what the impediments are. Tell us what the operating committee needs to know and needs to do. I believe we have no choice if we are to be the kind of company we want to be. We are willing to spend the time and money needed to do this and win."

For perhaps an hour Task Force members directed a series of questions were directed at the Chairman and President: "What do you want to be different at Alcoa 5 years from now?" "Why isn't the Operating Committee doing this themselves, instead of us?" "Paul, what were the quality barriers at International Paper?" "Fred, what about timing?" and on and on with more questions and answers. And then the 64 million dollar question, "Will we still be focussing on our aluminum activities?" (Only one member of the Task Force was from a non-aluminum part of the business.) Paul O'Neill replied, "I've not seen any data that shows me that this industry is doomed. . . . You can make a great success by being the best in an industry in which others make excuses for their poor performances. The business that you are not in and looks easy to you is a business you don't know much about."

The performance of Alcoa's two most senior officers was ostensibly persuasive. They were clear about why they were interested in quality, they were clear that they saw a long process ahead and they were clear that they were willing to invest in it. They were also clear in their charge to the group that it investigate total quality on behalf of the Operating Committee. However, after O'Neill and Fetterolf left and the Task Force debriefed what it had heard and how it now felt, some Task Force members were still uneasy about their mission. This discomfort had several sources including the members' unfamiliarity with O'Neill himself, an ongoing uneasiness about the basic strategic balance between the aluminum and non-aluminum parts

of the business, and most importantly for those on the Task Force who reported directly to the four Alcoa Group Vice Presidents—the “barons” on the Operating Committee—an uncertainty about their bosses’ support of the quality initiative. It was widely intimated among the group that the most powerful baron thought that total quality was bull, and that two others were at best neutral. Moreover, the Task Force commission had not been made all that explicit to anyone. The Task Force was working for and would report to the Chairman and President, yet most members still worked for the barons in whose hands their careers rested completely. It was also becoming clear that carrying out this Task Force mission would be a bigger job than they anticipated but nothing was being taken *off* their plates.

The seminar work continued all through day 3 with an analysis of Xerox’s efforts to install its “Leadership Through Quality” version of TQM being our main vehicle. At this time, January 1988, the details of the development and implementation of the Xerox Corporation’s version of total quality were only beginning to emerge in public. Tushman had done some work in the Xerox effort, and his intellectual partner David Nadler had been a central player in the Xerox “Leadership Through Quality” effort.⁸ Tushman relayed to the Task Force the thinking and tactics employed by the senior management at Xerox in managing what was planned as a four-year massive change effort. We showed videotapes of two of the key players at Xerox: David Kearns, the CEO who instigated the total quality effort, and Fred Henderson, who was the first Xerox Corporate Vice President for Quality. We examined the general framework of the Xerox total quality implementation plan and the levers that senior management at Xerox proposed to use in managing the company-wide change effort—including how Xerox had used or failed to use them. These ranged from Xerox’s cascading training program for all 200,000 employees worldwide, to micro management of senior managers’ own personal behaviors (role modelling), to changes in the organization structure itself, and on to changes in the corporate reward system.

The seminar closed down with the Task Force assessing what had been of value and what had not, as well as their taking the first steps in what would eventually be a very detailed assessment of quality management at Alcoa. This assessment, once started, would take on a power of its own and propel the Task Force into an even broader critical inquiry into the general management of the company. To create a reference point, the participants made a checklist of the beliefs, behaviors, systems, and processes of a total quality enterprise. Many components on this list were at considerable variance with existing practices in most U.S. companies and specifically in Alcoa. The Task Force prioritized the list according to what appeared to be most important and appropriate for Alcoa. In addition, they made an appraisal of how big it felt the gaps were. Opinions varied, of course, but most in the group felt that the components of total quality were appropriate

and that many of the gaps were substantial. This work, done in groups, helped consensus to emerge. Quality management, the Task Force concluded, was now looking much broader than statistical control, it was bigger than they had thought and could not be neatly separated from the rest of management.

Benchmarking

A week later the travelling began. Over a two-week period, the entire group visited companies that had acquired reputations as leaders in quality management, including Allen-Bradley, Corning Glass, Xerox, and Florida Power and Light. An internal visit was made to PEP Industries, an Alcoa subsidiary whose main business is manufacturing wiring harnesses for the automotive industry. PEP had been propelled and helped into Total Quality by Ford Motor Company and had been an early recipient of Ford's Q1 Award. A little later, there would also be influential visits to Preston Trucking and the Tennessee Eastman Division of Kodak.

All of this work was done before the Baldrige Award existed and before the term "benchmarking" had been popularized and so well codified. These highly structured benchmarking visits, organized and planned by Task Force Chairman Carter, were used to identify both overall quality management frameworks and specific quality management systems and tools that could be adopted and adapted at Alcoa. They were also used to test the reality of the theory. Carter's staff prepared a briefing book in advance of each visit containing basic background on the visited company and as many specifics on its quality management approaches as was publicly available. Using this material, the Task Force identified in advance the key issues to learn more about or to test at each visit. These objectives were communicated in advance to the host firm and specific Task Force members were assigned to acquire information on them during the site visit. Each Task Force member produced individual de-briefing notes on his specific assignment as well as on overall impressions. These data were assembled on the corporate plane on the way back to Pittsburgh and a typed summary report was frequently available the next day.

Among the general questions and issues explored on the benchmarking visits were the scope and definition of quality and quality management. Specifics that were asked included: How and why did the TQ program get started? What was the role of the corporate leaders? What were the specific TQ goals? What were the specifics on quality training, on the TQC organization, and on the external and internal resources required. What were the success stories, progress to date, and proof of success? A very important question on all visits was: "What would you now do differently and what would you advise Alcoa to do differently, and why?"

Now the Task Force work proceeded in high gear. In addition to their real jobs, members worked about half-time on the quality mission. Momentum and engagement were building. A report to the Chairman, President, and the Operating Committee was set for the end of February. In preparation, the Task Force also visited three other Alcoa facilities, and individual or pairs of Task Force members visited Ford Motor Company, LTV Steel, IBM, and AT&T at Oklahoma City. Input and data were solicited and obtained from 11 other Alcoa locations, and all Alcoa 1988 Business Unit Operating Plans were reviewed.

Two of the visits were particularly influential. The first was to Xerox, which we had already studied during the initial seminar. Xerox, like Alcoa was a manufacturer, had invented an industry and had held a monopoly. Xerox had been propelled into quality management in the early 1980s when, under attack from the Japanese, it had lost half its market share and saw complete disaster looming. While this had not (yet) happened to Alcoa, the Alcoa managers identified with and were moved by both by the struggles of Xerox and by the apparent success of their TQM counterattack. Xerox—and this was two years prior to their winning the Baldrige Award—proclaimed itself the first American company to win back market share from the Japanese, and without government assistance. Alcoa was a supplier to Xerox of the aluminum cylinders—the photoreceptors which copy machines use to form an image. A year earlier, there had been quality and cost problems and a threat of loss of the account. But Alcoa had worked hard to improve and in the process Xerox had taught the Alcoa plant in question some statistical control tools.

Xerox had been motivated to use quality as its change and survival theme by the success some years earlier of its Japanese affiliate. The Task Force read and analyzed Fuji-Xerox President Kobayashi's recounting of his push for the Deming Prize.⁹ Xerox had gone about its quality transformation in a particularly studied way. The role of Xerox Chairman David Kearns in the change process, the design of the "cascading" Xerox total quality awareness education, the parallel quality management organization that Xerox created and added to the existing corporate structure, the Xerox six-step version of the PDCA problem-solving process, the Xerox formalization and refinement of its competitive benchmarking process, and the overall Xerox total quality management change plan delineated in the famous "green book" that the Task Force examined but could not copy—all these elements had an influential impact on the ultimate Alcoa design. Even the Xerox name for its effort, "Leadership Through Quality," would be mirrored by the name Alcoa ultimately chose for its own program. None of this suggests that the Xerox story or program was bought uncritically. On some aspects, Xerox talked a better game than the evidence showed that they played. Xerox had also been an Alcoa supplier and inquiries around the Alcoa system on Xerox performance did not always match the "Leadership

Through Quality” rhetoric. The theme was: learn from Xerox, applaud them, and do still better.

The visit to Florida Power and Light—eventually, Alcoans would make three visits there—was influential in different ways. The Task Force quickly saw that the quasi-military management style at FP&L, and its wholesale and rather slavish adoption of Japanese total quality control techniques, would not find ready acceptance at Alcoa. Yet a number of FP&L elements were adopted. The FP&L quality improvement story-board method of running improvement teams was much admired and would be licensed from FP&L. The Alcoa senior managers were quite impressed with FP&L’s adoption of the Japanese style of Policy Deployment to give focus and accountability to the massive quality effort underway. There was a downside too. The thrust of much of the quality management effort at FP&L—then a year prior to their winning the first Deming Prize awarded outside of Japan—appeared to focus too hard on “winning the prize” and there were suspicions among some on the Task Force that FP&L was doing some things primarily to look good to the jury.

All in all, the benchmarking visits had an impact on the twelve Alcoa senior managers that no amount of reading, lectures by professors, or harangues by gurus could possibly equal. Whenever possible on these visits Task Force members paired off with their peers. (It became one of our standard requests prior to a visit.) They verified whether total quality had actually had an impact on their peers’ lives and management styles. Later on, we would expose the Operating Committee to similar experiences for that very reason—we wanted person-to-person transfer of experience. In a typical commentary, a senior Alcoa manager remarked on a flight back to Pittsburgh from a visit, “You know, Professor, we didn’t see anything different from what you had told us about weeks ago, or than what we’d read in Deming and Juran. But when Joe Blow, my peer at ABC Corporation, showed me what he’s been doing, the light really went on for me. Before, I understood it with my mind. Now, I believe it in my gut.”

The Safety Problem: Learning by Doing

One other experience had a deep impact on the Task Force: their hands-on examination of the issue of safety at Alcoa. Recall that in the introductory seminar, I used Alcoa safety data displayed as a control chart. The data used were monthly serious accident rates over a 24-month period at a major Alcoa mill, and it had been impossible to tell the difference between it and the red bead plot. I had walked slowly over to the tray of beads, leaned over it, cupped my hands to my mouth, and stage-whispered into the tray, “No red beads! No lost time accidents!” The group decided on the spot that it wanted to examine the issue of safety at Alcoa from a total quality perspective. More safety data were collected and processed TQ style: Pareto charts,

run and control charts, and the like. The Task Force spent a day defining specific safety problems and examined data linking cause and effect. The two-decade history of the safety program at Alcoa was recounted.

The Task Force seized on several points: how little data analysis was typically done on such problems; how improvements in safety had tapered off at Alcoa when management attention had waned; how easy it is to talk about, but how hard it is to actually get to the root causes of a social and technical phenomenon as complex as safety; the futility of managing via exhortation. They experienced first-hand their own deeply ingrained tendency toward a “ready-fire-aim” style of management. They also experienced the frustration of trying to improve a process where the special causes had largely been eliminated and where the remaining faults “were in the system” (as Deming would put it) or were “designed that way” (as Juran would put it).

This analysis of the safety issue at Alcoa was particularly striking to the Task Force because O’Neill—since his first day on the job as CEO—had stated publicly that safety in the workplace was his number one priority. At a January meeting with financial analysts in New York, while the Task Force was in session, he had said, “Alcoa’s most important human value is that its employees work safely. Some things are negotiable. Excellent safety performance is not. When you pay attention to all the details associated with achieving excellent safety performance and housekeeping, good economics will result.” Similar remarks had been made continually inside the company since O’Neill’s appointment in April of 1987. But it was now nearly the end of January 1988 and no systemic attack on safety had yet been mounted. This extended and painful self-analysis on the safety issue would color the thinking of the majority of the Task Force on quality. Several members recounted that some years back the safety program at Alcoa had produced real improvements and then had levelled off when an important leader retired. They mused: “What would keep a total quality program from duplicating this experience?” “What happens to quality if O’Neill leaves or if his attention gets refocussed elsewhere?”

Report to the Operating Committee

By February 18th, 44 days after the initial seminar, the Task Force was ready to fashion its conclusions and assemble a set of recommendations for O’Neill, Fetterolf, and the Operating Committee.

A particularly insightful aspect of the Task Force’s company assessment was its review of the Alcoa 1988 Business Unit Operating Plans from a freshly acquired total quality perspective. This work defined serious gaps between where Alcoa was currently and where a total quality driven Alcoa would have to be. The Task Force found that quality was not an explicit component of the business unit mission statements, strategy, or philosophy.

Overall, the understanding of quality was limited and, when it was included in planning, the focus was exclusively on a limited set of physical quality characteristics like surface finish or dimension. Tracking and monitoring of customer returns, product specs, and scrap were just beginning and measurements of rework, good parts per hour, and flow times were not routinely monitored. The business unit plans did not leverage improvements made at one plant across the system. Little evidence existed that suppliers were being brought into the Alcoa quality process. At most business units, specific quality goals were absent from the plans. Following on the century-old traditions of a capital-intensive industry, the Task Force observed that where there was a push for quality it was typically cast in terms of capital expenditures to replace older equipment. The business plans also revealed that generally quality improvement appeared to be a bottom-up process. Only in a few noteworthy cases was there a top-down process driven by senior management. Moreover, Alcoa appeared to be all over the map on philosophy and approach, with different units influenced by one of a number of outside gurus whose messages were at times in conflict.

Among the misconceptions about quality management that the Task Force found in the business plans were the following:

- Random production upsets that hurt Alcoa in the past will not happen in the future.
- The identification and prioritization of cost improvement projects can be done independently of quality considerations.
- Everyone *knows* that Alcoa's products are generally higher quality than the competition, and we can guarantee our quality without bringing our processes under control.
- SPC (statistical process control) can be "turned on" for specific customers who require it, and it is primarily a matter of running off some charts in order to help in marketing.
- Multiple sourcing by our customers is a way of life that our quality cannot change and our customers changing needs do not include higher quality from us.

In November 1987, just after the Task Force had been commissioned, Carter had taken a survey of the members' opinions on the level of quality in Alcoa. Graded on a scale of 1 to 10 (with 10 being excellent and 1 being terrible), the mean Alcoa overall score had been 4.6. Now, at the end of February, as the Task Force completed its initial quality education and benchmarking visits, they repeated the self-evaluation and the mean score moved down to 4.0. The individual evaluations also moved closer to one another. A framework for self and external evaluations was standardized and applied to several individual Alcoa business units, as well as to all the companies that had been benchmarked. In those pre-Baldrige days,

the Alcoa Quality Task Force had to create their own framework for this evaluation.

Of the outside companies visited, Xerox and Florida Power and Light scored highest overall. Of the Alcoa business units studied, PEP Industries scored highest, nearly as high as the two leading outsiders. This fact was to prove important to many Alcoans as evidence that quality management at its best was demonstrably possible inside the company.

While the Task Force formulated its findings and report to O'Neill, Fetterolf, and the Operating Committee, the Task Force's thinking was dominated by possible reactions of the Operating Committee, their direct bosses in most cases. The Chairman and President already shared a strong commitment to a new quality initiative, but how to convince the Operating Committee weighed heavily on their minds. Ultimately, the strategy adopted was not to try too hard to convince them and to state essentially: "We have done what you asked and examined quality inside and outside Alcoa. We have also studied quality management theories and practices as described by leading thinkers and as practiced in Japan. It, '*quality management*,' is bigger and more important than we imagined when we started. It is vital to the future of Alcoa. Moreover, we have changed as a result of what we have seen and *others* need to change too. Although, we can describe the main things we learned in the last two months, we do not expect our description to be convincing or sufficient. For you to understand what happened to us and what Alcoa should do, our most important recommendation is that you experience a process similar to what we just went through."

The body of the report was a series of points that summarized the activities of the Task Force and then listed the main findings in four categories:

- *Culture*: Quality is a rallying point around which an entire company can be energized. It is appealing to most people, building on their innate desire to excel and control their destiny. It is more inspiring than pure financial goals. Quality can be a win-win proposition vis-à-vis the union. The quality management view that 80% of the problems are with the "system" is a key contributor to this.¹⁰ On the cautionary side, quality is not a quick fix and those companies that see it that way fail. It will not become "real" until it permeates the values, norms, and culture of the organization.
- *Impact*: Quality is a differentiator that can be harvested in price and market share if it is perceived by the *customer*. In the short term, there are costs to beginning a quality effort—e.g., training, facilitators. Getting beyond the symptoms of quality problems to root causes and solutions is critical. Quality emphasis and metrics are quickly moving beyond detection to full product life cycle indicators and into staff and support functions.
- *Enablers*: Implementation of quality requires substantial changes and additions to the organization including training, creation of top-down commitment, and the creation of broad-based involvement. Distinct attitude changes are required, including: a focus on never-ending improvement against quantitative metrics; attention to and respect for detail at all organizational levels; a fact-based orientation in decision

making; and granting appropriate authority to worker teams. Successful quality efforts seem to involve substantial investments in people versus things. A change is required in supplier relations with the burden on us to understand our own needs, a thrust toward fewer suppliers and shared gains, early supplier involvement in product and process design, and a need for a formal supplier certification program. There is probably an 80/20 rule on the impact of quality management tools.

- *Strategies:* Quality can be used as a weapon to gain share; to produce a unique product; to set a pace competitors cannot sustain; and to reduce cost. Quality can be used to reduce barriers to progress and improvement in the organization—horizontal, vertical, supplier/customer, union/management, and staff/line. Quality can be used as a vehicle for focussed top-down deployment of an overall strategy/policy and as a vehicle for overall change of a broader scope. Quality can be used to close the gap between our performance and our goals or values on things that matter to the organization, e.g., *safety*.

The Task Force saw that their most important mission was to get a gut commitment to quality by the Operating Committee, and second to continue their work as that commitment was developed. To these ends they recommended:

- The issue of quality is so central to the business and its overall management and the magnitude of the changes needed around it are so great that a corporate quality office and officer are needed.
- You, the Operating Committee, should get educated on total quality. We will design for you an intensive study and travel program based on the best of our experiences.
- In the interim, we will continue to serve as a design team and will develop a quality implementation plan and structure for the company. Some elements of the Alcoa quality initiative must remain your responsibility and we will call these to your attention. *One of these responsibilities which remains uniquely yours, is the development of a corporate strategic objective statement, values, and guiding principles. An effective quality initiative cannot be mounted without this. . . .*

The Operating Committee Gets Educated

The Operating Committee agreed to all the Task Force recommendations and prepared to begin their education while the Task Force itself continued its exploration and design work. Later on, O'Neill, Fetterolf, and the Operating Committee would admit that they undertook this education grudgingly as they did not understand "why they needed additional education on a topic to which the group was so committed." In mid-April, a three-day Operating Committee quality awareness seminar was held at a retreat in the mountains outside Pittsburgh. There was an atmosphere of high stakes and high expectations on the part of the Task Force and all involved in the design and delivery. These were the men who *ran* the company and the conventional wisdom of total quality ideology was that the success or failure of quality management at Alcoa would depend on their engagement.

For Paul O'Neill this was another opportunity to put his own stamp on the emerging quality initiative, but to do so without inhibiting his team's

ability to discover it for themselves and thereby make it their own, as well as his. This group was his cabinet in formation, but they were not yet used to functioning as such for that was not the way Charlie Parry had run the company. Only nine months earlier, these same men had run the company under a different leader, with a very different style, and with a very different strategy. Only O'Neill was different. To date, not a single new face had been brought into the senior management ranks nor had anyone left or been removed. We knew of no precedent for O'Neill's strategy of changing the fundamentals of corporate mission and management style without at the same time changing at least some of the people at the top. Thus, this seminar and the field trips that followed were also supporting a parallel agenda of changing the outlook and style of the senior management team at the company—and of molding them into more of a team.

To start off the awareness seminar, the participants were asked to lay out concerns, issues, and questions about quality management they felt should be addressed. Several items on their list were the concerns of senior managers everywhere who face implementation of a quality initiative. One in particular was a most direct expression of a concern of many American managers. It was one of the Group Vice Presidents who asked, "How is quality different from metallurgy? I run a business in which metallurgy is at the core of all our products and processes. I know very little metallurgy and I have experts for that. It works well. But I'm told that quality is different and that I have to be directly involved. Is this true and if so, why? And exactly how do I have to be involved?" Another Operating Committee member asked, "I've been around this company long enough to have seen many programs come and go, including some quality programs. Most made sense on their face and had some initial impact, but for the most part the promises were never really fulfilled and eventually—in fact, not too long after their flamboyant introduction—these programs just fade away and we are back to the same old Alcoa we were before. What is going to make this 'total quality thing' any different?" A third member asked, "I've been to Japan and I've seen it in action there and I know it works, but that is a very different culture. Can we make it work here without becoming Japanese, without losing who we are and without losing our own distinct American and Alcoa advantages? I don't think we can or should try to make Alcoa into Toyota."

These issues and others were squarely faced and explored, but clearly not settled outright. The prime seminar objectives, however, were achieved: An ecumenical framework of contemporary quality management was developed and critiqued. The magnitude of the change from traditional management practices was articulated, and the process and problems of such a large scale organizational change discussed. At all points in the deliberations, the relevance to specific Alcoa situations was at the fore. We again did the red bead experiment and the Xerox case study. By the end of the three days,

it was the judgement of our attending Task Force coach, and most importantly of our chief customer, Paul O'Neill, that the seminar—the first step in the Operating Committee's education process—had “worked.” Now the whole Operating Committee—including O'Neill and Fetterolf and accompanied on each trip by several members of the Quality Task Force—went benchmarking to Tennessee Eastman, to Florida Power and Light, and to Alcoa's own PEP Industries. Paul O'Neill visited one-on-one with David Kearns, the CEO of Xerox.

A consensus was forming and enthusiasm was growing, and there was a sentiment that Alcoa “is probably doing this ‘just in time’ for we are at best half a step ahead of the competition, if that.” In early May, the Operating Committee and the Quality Task Force participated in an event that would prove to have a very high impact and further solidify what the responsibilities of the senior management in leading quality management really were. It was an “Alcoa Quality Day” and it enabled the Operating Committee to generate a good part of their own answer to that month-old question, “How is quality different from metallurgy?” Tom Carter identified and brought to Alcoa's Pittsburgh headquarters eight successfully implemented quality improvement projects from around the company. The goal was to show some of the best of what was already happening inside Alcoa and to illustrate with homegrown Alcoa examples many of the quality improvement themes that had been discussed in the seminar, encountered in the readings of Deming, Juran, and Imai, or seen on external benchmarking visits. We included projects that spanned a broad range of applications: internal supplier-customer relations; cooperation with external suppliers; and satisfying an external customer. They had projects that utilized a complete set of problem-solving tools and methods ranging from the simplest of Pareto charts through more complex statistical process control and sophisticated designed experiments.

There was an air of excitement in the Alcoa Corporate Conference Room at Pittsburgh Headquarters that morning. A score of presenters had been flown in for the occasion from all over the Alcoa system. The first speaker, with a boxer-like build and ruddy complexion wearing a suit that was neither Brooks Brothers nor Armani, stood with very apparent nervousness in the corner of the room. The primary audience was more than a score of Alcoa's most senior managers including the CEO and President—enough to make anyone a bit nervous. The master of ceremonies welcomed everyone and then simply said, “We'll get started with the presentation by the Warrick Mill.” Our man stepped to the podium and introduced himself: “I'm Ralph Box. I'm a baking room operator from the Warrick Mill and this is not my usual Monday morning.” The room exploded with laughter, but quickly hushed attentively as Ralph detailed his role in a project that had made significant quality and financial improvements. He spoke with obvious knowledge of gauge capability, and interpreted complex statistical control charts. His

business sense and his pride of these accomplishments were evident and impressive. This was high-power employee involvement already in place somewhere in Alcoa. And so it went: from improved process control in anode baking, to better relations with a major carbon supplier, to the elimination of over-control in smelter tapping, to use of complex statistically designed experiments, to reducing the cracking of ingots as they are cast.

After five hours of project presentations and follow up questions and answers, all the presenters and observers save the Operating Committee left the conference room. The Operating Committee debriefed. Several questions went up on the flip chart: “What are the most important things we have heard and learned?” “What does this imply for what quality management should be at Alcoa?” “What does this imply for *our* roles in quality management at Alcoa?” They homed in on several conclusions. First was that individually and collectively they, the Operating Committee, were remarkably ignorant that there was this level of quality improvement activity and competence—even in their own businesses. Second, it was obvious that Alcoa as a corporation had done little to create, sustain, and encourage this activity—to date quality at Alcoa was a bottom-up, grass-roots, almost underground movement. Third, there was very erratic performance overall—excellent as these examples were, they were isolated pockets of excellence. Moreover, there had been no meaningful dissemination of the results of these improvement projects to other locations or businesses, not to speak of dissemination of the quality improvement methodology itself. Fourth, although several of the projects dealt with complex technologies, there had been no involvement of the Corporate R&D resources at any stage. A major conclusion that would shape the actions of the Operating Committee emerged from this several-hour discussion and working session: *“It is our responsibility to create an Alcoa in which this excellence is the rule rather than the exception—an Alcoa in which excellence is shared, systematized, and rewarded.”*

Bringing It All Together—With the first wave of the Operating Committee’s education and benchmarking completed, and the Task Force coming to closure on its recommendations for specific quality management systems, tools, training, and the like, an extraordinary day-long joint meeting of both groups was held on May 27, 1988. The day was structured to bring the thinking of the Quality Task Force and Operating Committee together, to see if they were congruent, and to take important implementation decisions. Each group had a specific set of issues to report on and was to spend the morning by itself putting the final shape to its findings and recommendations. The Operating Committee was to present its long-term goals and its image of what it wanted quality management to be at Alcoa, while the Task Force was to provide the specific “enablers” it had been

developing. The day would end with the Operating Committee again closeted to review and act on the day's proceedings.

The Operating Committee reported first. They were now deeply involved in quality and were particularly excited this morning, having just spent the previous two days on a variety of quality related tasks, including the last of their benchmarking visits. They were eager to share what they had done and learned, to hear from the Task Force, and to get on with the job. They now understood why the Task Force had been so insistent about the need for them to get educated and to travel. They too had changed. During their long morning session, the Operating Committee had framed their conclusions as follows: "What," they asked, "would we want a visitor from space, who descended into Alcoa five years from today, to see with respect to quality management?" Several flip charts were filled in freewheeling brainstorming style and these were then critiqued and organized. Their image of quality management was:

- A commitment to be the best. Aggressive benchmarking with trending. A consistent definition and processes across the company.
- A strong focus on the customer. An Alcoa that knows who its customers are, what they need, and how satisfied they are. Systems in place to elicit data and feedback on this.
- Quality processes, systems, and culture are institutionalized. These should be unifying and motivating and relate to both individual and team improvement efforts.
- A quality culture that produces 59,000 "Larry Birds" [referring to qualities that the Operating Committee saw epitomized by the great Boston Celtic basketball star] excellence, teamwork, selflessness, competitiveness, and hard work.
- There should be an Alcoa scientific problem-solving process deployed and used across the company—on the pattern of the PDCA, Xerox, or FP&L systems.
- Wide use of teams as appropriate. Teams should be fact-driven, flexible in structure and mission. Teams should be guided and managed. [There was a strong aversion to the concepts and name "Quality Circles."]
- A formalized Alcoa set of guiding principles is required, including Alcoa vision and values statements.

Having been "charged" by the Task force with working on a set of guiding principles for Alcoa, the Operating Committee at this point simply acknowledged that they too shared in the assessment of how important was this need was for a new focus and stated that they had begun the work. They closed their presentation with a list they generated of 14 prioritized characteristics of excellent companies. The Committee had also given their own appraisal of where they felt Alcoa stood. Thus, with this list they had come a long way toward jointly defining their problem. (Again, had the Baldrige framework existed at the time, some of this work might have been simpler.) All that remained would be execution.

The Operating Committee's Characteristics of Excellence

Priority	Characteristic	Importance	Alcoa Score
1.	Being the Best	100	48
2.	Safety	95	64
3.	Quality Process	84	43
4.	Importance of the Individual	74	51
5.	Meaning to Employee	71	53
6.	Ethics and Integrity	65	81
7.	Excellence in Manufacturing	54	47
8.	Execution, Attention to Detail	54	37
9.	Good Corporate Citizenship	49	78
10.	Growth and Profits	46	32
11.	Technology	33	60
12.	Innovation	32	31
13.	Shareholder Value	26	30
14.	Knowledge and Education	20	42

The Task Force was pleased with the congruence in the Operating Committee's report and their own thinking on these issues. They could have written this report themselves. Now it was the Task Force's turn, and Tom Carter presented their recommendations. His opening remarks were passionate and startling to the Operating Committee. "We have worked diligently at this quality charge you put before us. We thank you for the opportunity. We have been changed and convinced as a consequence of what we have done. We are taking up this quality mission and you cannot take it away from us. We will proceed regardless of what you do!" The Operating Committee members glanced sheepishly and perplexedly at one another—who was denying anyone anything?

The content that followed that challenge was straightforward, given where everyone now stood:

- More education and training for both groups and the design of a quality awareness training for the "top 100 in the company." (This would soon become the top 300 or so.) Topics like benchmarking, team processes, reward systems, and the like remained to be explored in depth.
- The work of the Operating Committee on values and guiding principles was urged on, and it was recommended that it be augmented by an Alcoa Quality Policy.
- A senior Corporate Quality Officer was called for and it was recommended that the person be a member of the Operating Committee. A list of desirable characteristics for this person was offered.
- Specification of top management roles and accountabilities were to be defined by the Operating Committee with primary attention given to the roles of the CEO, the COO, the Corporate Quality Officer, and the Group Vice Presidents. The Task Force offered recommendations on these roles.

- A set of quality management enabling mechanisms and tools were identified for development and deployment, these included a variety of quality related training, a problem-solving process, and an Alcoa Quality Book or master implementation plan (patterned on the “Green Book” quality process definition and implementation plan of Xerox).
- The Task Force declared their jobs done and resigned as a body, but they recommended that a standing-senior level Quality Steering Committee be created to serve as an advisory body on the implementation. They then all agreed to serve on this body, if appointed.

After some joint discussion, the Operating Committee went into session by itself to consider the recommendations. All were accepted in principle, although some needed to be worked on over the coming weeks and months. By the end of the afternoon they had selected Alcoa’s new Vice President for Quality. He would be Thomas L. Carter, the Quality Task Force Chairman.

Vision, Values, and Milestones

During their external benchmarking visits, the Task Force had been very impressed with how tightly the quality programs at the host firms were linked to a larger sense of corporate purpose. Whether it be Xerox, Toyota, Florida Power and Light, or Tennessee Eastman, the quality strategy, goals, and ethics were always contained within a larger all-encompassing mission and value statement. Such linking with a larger purpose also came up in their readings. Perhaps at first, reading Deming’s opening comments to Japanese business leaders in Tokyo in 1950 may have seemed corny—“International trade is an essential component of peace and prosperity. International trade depends on quality . . . quality leads to productivity, to competitive position . . . to jobs, jobs, and more jobs for the Japanese people.” His first point, “strive for constancy of purpose,” may have seemed a platitude until CEO Donald Peterson of Ford stated that focussing on corporate purpose was the single most important thing that Deming had taught the world’s second largest automaker. The Task Force quickly became convinced that the level of extraordinary quality achievement that they envisioned for Alcoa would simply not be attainable unless the quality effort was linked to a higher sense of purpose for their company as well.

There was, however, no Alcoa corporate mission statement that any Task Force member was aware of. On investigation they would later discover one tucked away in the archives and indeed, it seemed that every ten years or so a new Alcoa values statement would be articulated by someone at or near the top of the company and then filed away. Alcoans had long thought nobly of their company, of its ethical behavior, and of its contributions to society

and to the nation. To many the company had been a kind of family, literally and figuratively—remarkably, one of the officers on the Task Force would shortly occupy the same vice presidential position as had his father. In only a few companies would employees at all levels refer to themselves with a term like “Alcoans” and really mean it. Though some said these feelings were weakening, and cynics said they were completely gone, one could feel how strongly the Task Force felt these sentiments. What’s more, a psychological void had been created by the sudden transition from CEO Parry and his diversification strategy to CEO O’Neill and his back to aluminum strategy. The Task Force had not been pleased when, during their initial deliberations in January, they had seen a newspaper account of a speech O’Neill had given to New York security analysts expounding on Alcoa values—values that had not been discussed or affirmed within the company. The concern was less with the substance of the remarks as with a feeling that “nobody told us, nobody asked us” and a fear that a possibly fleeting opportunity would be missed to reach out to bring all Alcoans together again and get the company refocused.

The Task Force recommendation met with a favorable response from the Operating Committee, and once the issue was put before them they too felt a strong need for clarification and focus. At meetings with the rank and file and mid-level managers, Operating Committee members were confronted with confusion about what parts of the old strategy were still valid, about how significant the changes really were, and about which of the old Alcoa values still held. Many Alcoans were saying, “We’re confused, we need to know where we are going.” The Operating Committee saw inconsistent behavior with respect to the company’s implied values. And there was real concern, even fear, among some business unit managers about a new set of demanding financial targets that O’Neill had set for the company.

An enormous research, formulation, feedback, and revision effort was unleashed that would go on for months. Though the Operating Committee undertook the responsibility of formulating the mission statement, the Quality Task Force stayed involved doing background work, benchmarking the vision and mission statements of other leading firms, and serving both formally and informally as a sounding board for the long series of drafts that the Operating Committee would produce. By my tally, the Operating Committee spent at least 11 full days in plenary session on discussion, drafting, redrafting, and the like. And that does not count the very considerable time spent singly or in small groups working on support tasks.

As this work was going on, the Operating Committee was getting closer to its own articulation of what quality management should be at Alcoa. Indeed, the two tasks became inseparable. The work began in May and the final articulation of the “first draft” was not arrived at until September. With communication to other senior level managers and reaction to their feedback, the final product was not ready for roll-out until January 1989. During

those months, there was hardly a time when the Alcoa mission statement was not being actively worked on by the Operating Committee. “Forged” is the operative expression, for every single word and phrase was hammered out with great care. When they were finished, this group of the nine most senior Alcoa managers would have a document that each had a tremendous investment in, one that they expected would be the compass to guide Alcoa into the future. It would be called the “Alcoa Vision, Values, and Milestones.” The *Vision* was to be the target, a setting of the corporate sights on where Alcoa wanted to be in the future; the *Values* were to be the standards the company and its employees would live by; and the *Milestones* would be the measures and checkpoints along the way that would both mark out progress and specify what remained to be done. A year later, Paul O’Neill would refer to the Vision and Values document as Alcoa’s enduring constitution that would take it into the next century. The final articulation, arrived at after many weeks of internal debate and several rounds of feedback from business unit and other upper level managers, was:

Alcoa’s Vision

Alcoa is a growing worldwide company dedicated to excellence through quality —creating value for customers, employees, and shareholders through innovation, technology, and operational expertise.

Alcoa will be the best aluminum company in the world, and a leader in other businesses in which we choose to compete.

This was more a statement of intent and ambition than of fact. In fact, the company had not been growing for some time. While it had important but very selective international operations and relationships, it could not truly be called international or worldwide. The best aluminum company? Some in the company and outside clearly thought so, but as more cross-industry benchmark data on product and process performance and on management practices became available, the self-evaluations were becoming harsher. “We’ll know we are really the best,” said Fred Fetterolf, “when the only question left on the table is who is second, and when our performance level is world class, not just the best in our own industry.” It was hoped by the Operating Committee that the phrase “leadership in other industries in which we choose to compete” would clarify the role and standards in Alcoa’s emerging other businesses like ceramics in which it would simply not be credible for neophyte Alcoa to claim to be the best. “Be a player and leader now, then raise the stakes,” said an Operating Committee member.

Alcoa’s Values

Integrity: *Alcoa’s foundation is the integrity of its people. We will be honest and responsible in dealing with customers, suppliers, co-workers, shareholders, and the communities where we have an impact.*

Safety and Health: *We will work safely in an environment that promotes the health and well-being of the individual.*

Quality and Excellence: *We will provide products and services that meet or exceed the needs of our customers. We will relentlessly pursue continuous improvement and innovation in everything we do to create significant competitive advantage compared to world standards.*

People: *People are the key to Alcoa's success. Every Alcoan will have equal opportunity in an environment that fosters communication and involvement while providing reward and recognition for teams and individual achievement.*

Profitability: *We are dedicated to earning a return on assets that will enable growth and enhance shareholder value.*

Accountability: *We are accountable—individually and in teams—for our actions and results.*

Who could disagree? Was there, is there substance here? These statements might appear at first reading like “motherhood and apple pie” platitudes. But not so to the Operating Committee who labored mightily over them and who proposed to run the company by them, to live by them, to be personally accountable on them. Each word and expression included was evaluated from the standard, “Can we fully commit to that?” As an example, the Integrity value at one time included the word *fair* as in “we will be fair and honest.” There was a long debate on the point that while Alcoa might want to be fair, and indeed strive to be fair, it could not guarantee fairness. So, out went “fairness.” At the end of this process, the Operating Committee had words to live by. The quality thrust that had initiated this work was further amplified by a quality policy statement which became an integral part of the package.

Alcoa's Quality Policy

We are committed to quality in everything we do. It is Alcoa's policy to:

- Provide products and services which consistently meet or exceed the needs of our external and internal customers through the efficient use of resources.
- Involve all Alcoans in never-ending improvement in the quality of products, processes, and services.
- Provide every Alcoan with the training and tools necessary to contribute to the quality effort.

Our success will be measured by the satisfaction of our customers.

Both the Task Force and the Operating Committee had been strongly influenced by the frequent appearance of the theme of management by fact, by the repeated emphasis placed on the importance of specific *measurable* goals at each of the companies benchmarked, and by the policy deployment technique that was used at some of the benchmarked firms to assist in answering the 64 million dollar question: “Alright, now that we have articulated these noble aspirations, how do we propose to make them happen?” They moved part way toward an Alcoa response with the development of the “Alcoa Milestones.”

The work started from the question “How will we know when we are there?” An exercise they used to develop responses was to imagine that a

visitor from outer space would descend on Alcoa in five years. “What would you expect him to see as he walked the halls of our offices, the aisles of our mills?” Such a visitor wouldn’t be fooled, he would be naive but intelligent and perceptive. All agreed that, like Deming, this visitor wouldn’t be impressed by slogans, ambitions, or other quality management “artifacts.” He’d have to see specific behaviors, systems, and performance to demonstrate that Alcoa had already made progress towards the vision, values, and quality policy, and was really on the road to world-class excellence. In the spirit of the total quality ideology that states that if you can’t measure it you can’t manage it, he’d need measures of progress and performance—or in the jargon of total quality, “metrics.” So began the development of “The Alcoa Five-Year Milestones.”

While the Task Force played a key role in proposing them, the Operating Committee, after more feedback from the middle management ranks, made the final definitions. (Actually, the Vision, Values, and Milestone statements were all rolled out simultaneously.) The Task Force laid important groundwork by defining a set of desirable characteristics for milestones which included that they should be: measurable, actionable, enduring, significant, encompassing a sense of “best” and of “stretch,” limited in number, simple to understand and use, and owned. They should also be communicable, motivational, and *enabled*. This last word was meant to capture the idea that attainment of the milestones must be supported by the investments and actions of the company and its most senior management. (Echoes of Deming again. His Point 11 states: “Stop giving arbitrary targets, goals and quotas to the work force without the means to achieve them.”) There was a strong aversion to throwing up a wish list to the rank and file and hoping for miracles to happen.

This work was tough going, the list of criteria was awfully long and the drafters were getting tired. After many rounds of discussion within both the Operating Committee and the successor to the Task Force, communications to selected members of the next level of Alcoa management, and revisions based on the feedback received, they produced the final Milestone list (see below). By now the Operating Committee had put in at least 22 days of work in plenary sessions—and still more on their own or in small sub-groups—getting educated on quality, doing benchmarking, and designing the Alcoa quality constitution. It would be understandable that fatigue was setting in. The final list was arrived at perhaps as much by acquiescence as by active consensus.

Five-Year Milestones for the Alcoa Vision

Customer Commitment

- *Establish interactive relationships with internal and external customers and suppliers based on understanding of real needs and performance to targets with evidence of continuous improvement.*
-

Employee Involvement

- *Everyone clearly understands their customer needs.*
- *Clear definition of accountability for each team and individual.*
- *A team approach to problem solving and continuous improvement.*
- *Provide the training and education to enable all Alcoans to excel in their jobs.*

Excellence

- *Over the next five years, achieve a 50% reduction in serious injury and lost workday incidence rates as we move toward our goal of an injury-free workplace.*
- *For each process, activity, and technology, benchmark our position against best in the world. Close the gap where advantage can be gained.*
- *Critical Processes in control and capable.*

Financial and Growth

- *Average 15% return on shareholders' equity, not less than 10% in any year (and corresponding return on assets and return on investment.)*
- *Achieve growth objectives through improved asset utilization and approved expansion plans and pursue additional corporate growth as required to realize a 20% real growth in revenue above 1988 levels while achieving corporate financial return objectives.*

Five-Year Milestones for the Alcoa Values

Integrity

- *Be completely aware and committed to our conduct and behavior. (High now, same in five years.)*

Safety and Health

- *A 50% reduction in lost work days and Serious Injury Frequency.*
- *Stress [reduction]*
- *Housekeeping better*
- *More involvement of hourly [employees]*

Quality

- *Know and meet more customers' needs*
- *More processes in control*
- *More benchmarking*
- *High level of awareness*
- *More partnerships with (less) suppliers*
- *Internal customer needs met*
- *Facts used and available*

People

- *More minority and females in management positions*
- *Higher selection standards*
- *More involved in High School preparation of students for Industrial Jobs*
- *Greater number of cross-functional teams and involvement*
- *More apprentice training and development*

Excellence

- *Objectively understand World Standards and gaps closed/closing*
- *Win the Malcolm Baldrige Award*
- *Be the Benchmark*

Looking at the Milestones in the light of the Task Force's own criteria, what is an observer to make of them? On their face and as a package they are directionally appealing, yet individually some of them clearly violate the defining criteria. Importantly, only a few were measurable. A suggested solution was to put "metrics" on each—a complicating "fleas on the backs of fleas" suggestion. If these milestones were to be the central thrust of the company, there were some gaps that might be perilous: There were *no* milestones on innovation, *no* milestones on technology. What would be the impact on the morale and behavior of Alcoa managers. Some of the metrics were definitely "stretch objectives," so much so that some managers argued that they were demotivating. There was much inconclusive debate on this vital point, and two Milestones that got particular attention in this regard were O'Neill's 15% ROE target and the critical processes in control and capable milestone. Would the marketplace—the price of aluminum ingot on the London Metal Exchange—permit the former, and would the time span of 5 years and the resources in place enable the latter? Matters of opinion surely, and how this would play out remained to be seen. To one senior Alcoa, the milestones looked like a score of crushing new priority "ones," while to another they were his Magna Carta for the next five years.

So in January 1989, one year after the Task Force began its work, this first part of the job was done. The new Alcoa constitution was written with quality at its core and Paul O'Neill, Fred Fetterolf, and the Operating Committee felt that Alcoa was poised to *start* its quality journey. Many saw the Alcoa quality effort—at this time still unnamed as the company sought to avoid the "quality management is another project" stigma by refusing to have it labeled—as the key to its future. In a short while, it would be named and its spirit portrayed with a variant on the Alcoa stylized "A" logo. "Managing for Quality" sat at the apex of the A, with "Continuous Improvement" on the left leg of the A, and with "Employee Involvement" at the right leg. In the white space under the A's crossbar sat the "Customer."

Under this banner, the good ship Alcoa would sail off to the quality wars. A few on the renamed and restaffed Corporate Quality Steering Committee imagined that one destination along the way might be the Malcolm Baldrige National Quality Award.

They and the new Corporate Quality Group were already hard at work creating the enabling mechanisms and resources for the quality journey—designing an Alcoa Problem-solving Process, rolling out the first wave of quality awareness training to the "top 100," codifying a benchmarking process, and the like. As the process continued it was looking less and less

simple, but more and more important to most Alcoans involved. There no longer appeared to be any serious question of whether Alcoa would do total quality or what the broad parameters would be.

Epilogue

If the replacement of CEO Parry by CEO O'Neill was the dropping of one shoe, the other shoe dropped at Alcoa on August 9, 1991 when on short notice Paul O'Neill summoned some 50 of Alcoa's senior executives to an extraordinary meeting at Pittsburgh Headquarters. No agenda had been announced, and tension and rumor were rife since all present knew that President Fred Fetterolf had resigned two weeks before "over differences in policy." No explanation of what those differences were had been offered.

Opening the proceedings, O'Neill announced that the meeting was to discuss "change, but that two things would not change—the Alcoa Vision and Values." The changes he then announced were sweeping. In addition to the departure of Fetterolf, three other members of the Operating Committee had taken early retirement along with the Vice President of Engineering. There would be no replacement for the departed President, and the Operating Committee would cease to exist, as would the Group Vice Presidencies. All 25 business-unit managers would be given broader authority and bigger responsibilities and would henceforth report directly to the CEO. Paul O'Neill envisioned the new organization as an inverted triangle or pyramid with the business units and their customer relationships—the value-creating activities—forming the broad base of the triangle at the top of his diagram, the pooled corporate resources that service the business units one level below, and the CEO below that, the apex of the triangle at the bottom of the diagram. Two layers of the organization had been cut away.

Equally striking, the complex and fuzzy milestones were replaced with three intense and focussed imperatives:

- Cause your operating assets to perform at world-leadership rates. If someone else is doing it better you are not meeting the standard.
- Live by the Alcoa Values and Policies.
- Adopt quantum-leap improvement objectives that will at a minimum close 80% of the gap between current performance and the world benchmark on those few measures critical to your business.

The last of the above objectives would be the one that O'Neill would lean on particularly heavily as he impelled Alcoa management to accelerate the pace of change. Ironically, it is less stringent in this articulation than in its original version in the "Milestones," but the charge now appeared more forceful when put in isolation from the rest and when the CEO made it his *primary* focus. It was as if Alcoa had said it before, but hadn't really meant it. How strongly he now felt about the benchmark performance issue was

reinforced by the other central change in O'Neill's thinking. "I believe we have made a major mistake in our advocacy of the idea of continuous improvement," he said. "Continuous improvement is exactly the right idea if you are the world leader in every thing you do," he explained. "It is a terrible idea if you are lagging behind the world leadership benchmark. It is probably a disastrous idea if you are far behind the world standard. In too many cases, we fall in the second and third categories. In these cases, we need a rapid quantum-leap improvement . . . [else] we will never be the world leader."

What inspired these changes? Over the more than two and a half years since "Excellence Through Quality" and the "Vision, Values, and Milestones" had been rolled out, and while he was convinced that the Alcoa constitution and direction were sound, Paul O'Neill had become increasingly frustrated with the pace of improvement at the company. There had been real improvement and the financial markets and the business press had recognized it, but in private O'Neill's impatience showed through.¹¹ He was not about to wait for wrenching change to be imposed on him and Alcoa by external forces, as had happened at Xerox in the early 1980s and as was happening now, in the early 1990s, at General Motors. O'Neill was aware of painful shortfalls in Alcoa performance relative to the best of its competitors—even on some processes that Alcoa had *invented*. He also knew of substantial process performance gaps between Alcoa mills carrying out identical operations. The Alcoa quality effort was not addressing these gaps fast enough, he thought, and it never would "if we persist in our use of the traditional command and control system of management where many thousands of people believe their only responsibility is to do what they are told to do."

At the August 9th meeting, Paul O'Neill drove home his points with sharp observations and some disquieting facts. He said, "I am no longer willing to accommodate myself to the pace and direction of the organization when my own observations and instincts tell me we should be doing something different."¹² The examples he cited began with the issues on which he had been focussing since his first morning as Alcoa CEO: safety, the environment, and customer satisfaction:

"While we have reduced our serious injury rate from 5.48 in 1987 to 3.80 [currently]; Du Pont is at 1.08 and even more alarming is that 19 Alcoans have been killed over the last four and a half years [of my tenure as CEO.]"

"While we have always been committed to environmental protection we have just paid a record \$7.5 million fine to the State of New York."

"We operate some of the lowest cost alumina refineries in the world, but the levels of fines and soda [a pair of chronic quality problems in that industry] are not providing customer satisfaction."

He also cited a number of other crucial operational and financial issues, one of which particularly merits attention here as it simultaneously

illustrates an issue that had for some time been a key irritation to O'Neill, relates to one of the central of the "Alcoa Quality Milestones," and brings us full circle back to principles emphasized in Deming's 1950 Tokyo lectures. He said, "We have constructed more Hall cells¹³ than any other company in the world, yet our pot life is below the industry average; and this process, which we invented and have operated for over 100 years, is not in [statistical] control and [is not] capable [of meeting specifications consistently]."

To many observers these announcements were jarring discontinuous changes—changes which some interpreted as O'Neill's repudiation of total quality. A red flag to orthodox TQMers was his rejection of that arch TQ theme "continuous improvement." But not so to the man himself. In a recent conversation, he said "Back there in '88 and '89, we were learning to do quality, now we are really doing it. We have gone through a shifting of the gears, and perhaps the last shift up was, well, quite a bit bigger than the others."

It seems me that the package of changes Paul O'Neill implemented in August of 1991 is consistent with the philosophy and goals he had articulated from the outset, and with his own personal very hands-on style. While the changes also can be seen as fitting within the quality framework that Alcoa had developed, they do significantly bend that framework. And, there are issues here worthy of some reflection. One can question whether it was necessary—indeed, whether it was dysfunctional—to dismiss and bad mouth "continuous improvement" in order to emphasize, as needed to be done, the requirement for breakthrough improvements. Some observers and students of change and innovation processes propose that continuous improvement and breakthrough change are ideas in conflict, that an organization that emphasizes the former will inhibit the latter. My colleague in much of the Alcoa work, Michael Tushman, is of this persuasion and we have argued the matter often. When Tom Carter raised the issue even before the Task Force work began, I took a "Japanese position"—agreeing with the Kaizen philosophy that continuous improvement should enhance a firm's ability to carry off breakthroughs by adding greatly to its storehouse of product, process, and customer knowledge, and by adding to its ability to implement and maintain the breakthrough changes.¹⁴ If this is true, then a false choice has been posed, and one needs both. Moreover, the "Excellence Through Quality" initiative had invited all 60,000 Alcoans to participate in continuous improvement, had trained them to do so, and had at great effort organized countless improvement teams that were already working at the time of the August 9th announcements. What were these Alcoans to make of their Chairman's statement that this continuous improvement concept to which they had just been wooed was a "disastrous idea." Most of these people would have no opportunity to participate in a quantum-leap improvement on one of the "few measures critical to your business." In the total quality roll-out, they had been told that they were

part of a new team approach. Was that part of the “Excellence Through Quality” pact still intact?

Second, in these August 9th changes at Alcoa, one can see an intensification of the tension between competing long- and short-term goals. Even before this meeting, there were a significant number of Alcoa managers who felt and acted as if the quality talk was well and good, “but when you get down to it, you’d better make your numbers.” “Do I hit my 15% ROI target this year, or invest in my breakthrough improvements for two [and more] years out?” Answer, “YES.” Managing the tension that exists here will test the maturity and patience of Paul O’Neill and Alcoa and the integrity of their quality process.

In closing, and still speaking to the last point, we observe that no American company we have studied closely has satisfactorily resolved a key TQM implementation problem—one which Alcoa diagnosed during its first benchmarking visit to Xerox. The dilemma was expressed nicely for the visiting Alcoans when their Xerox host said: “This store is open for business while under repair!” Or, in other words, “How do we do all this improvement ‘stuff’ and still make and sell product?” Xerox, its Baldrige Award notwithstanding, recognized the problem but never resolved it. It took Xerox senior managers years to recognize that major elements of its well-designed “Leadership Through Quality” program were not being effectively implemented, that it was not fulfilling on the grand design. Under pressure for quarterly results, many business unit managers at Xerox had gone back to business as usual and quality management processes had been in effect shelved. Xerox was finding that, strenuous as they are, quality program design and quality training are the easy parts of total quality. The implementation is what is really difficult. Four years after the roll-out, when Xerox did a rigorous self-assessment as part of its preparation for the Baldrige Award Application, it created an extensive list of required enhancements to its quality efforts. These have only partially been addressed, and yet Xerox is now moving “Beyond Total Quality.” Perhaps this is the American way.

Up to the time of the August 9th changes and despite its awareness of some of Xerox’s problems, its refinement of many of the Xerox processes, and its more than doubling of the amount of training given its senior managers over that of Xerox, Alcoa hadn’t resolved these problems either. As noted above, one could also see Alcoa managers struggling, “Do we do the business or the quality stuff?” And they too were seeing that the quality stuff really was a lot harder than they’d like, and the payoffs were not immediate. The Alcoa Task Force had been very critical of Xerox for mounting such an elaborate quality effort and then waiting years to evaluate its effectiveness. Yet to date, Alcoa has not done its own broad self-evaluation. The deep culture, systems, and technology changes that the highest levels of quality management require do not appear to yield to the “quick study” and rapid implementation that the American corporate culture

seems to demand. It really remains to be seen whether the August 9th changes, the “Excellence Through Quality” Architecture, and most importantly Alcoa’s continuing follow-up will propel it to the world eminence and outstanding performance that are its CEO’s goals.

Alcoa has never adopted any particular company as a TQM role model, but once when questioned about which other companies he specially admired, Tom Carter, the Alcoa Vice President for Quality said, “Well, I don’t know if there are any 10s out there, but Toyota Machine Tool sure is a 9+.” He went on to add, “And Toyota got to where they are by 40 years of relentless work. At Alcoa we don’t have 40 years.”

References

1. For about an 18-month period, the author served as the chief outside consultant to both the Quality Task Force that designed Alcoa’s quality initiative as well as to the senior management “Operating Committee” that directed the implementation. During much of the time he was joined in this work by his Columbia Business School colleague, Professor Michael Tushman. Peter Kolesar’s research and teaching background is in engineering, operations management, and applied statistics. He entered the world of quality management through that avenue. Michael Tushman’s work by contrast is concerned with organizational design and change, and the management of innovation.
2. For a detailed history of Alcoa up to this time, see George David Smith, *From Monopoly to Competition: The Transformation of Alcoa, 1888-1986* (New York, NY: Cambridge University Press, 1988). The articles of Michael Schroeder and Thomas Stewart carry the story forward to the appointment of O’Neill as Chairman and CEO and his redirection of the company. Michael Schroeder, “The Quiet Coup at Alcoa,” *Business Week*, June 27, 1988, pp. 58-65; Thomas A. Stewart, “A New Way to Wake Up a Sleeping Giant,” *Fortune*, October 22, 1990, pp. 90-100.
3. The Operating Committee included the Chairman and CEO, the President, the Chief Financial Officer, the General Counsel, the Vice President of Human Resources, and four Business Group Vice Presidents. When we write about the meetings and activities of this group we include all the aforementioned as participants.
4. The content of Deming’s 1950 Tokyo lectures may be found in W. Edwards Deming, *Elementary Principles of the Statistical Control of Quality—A Series of Lectures* (Tokyo: Nippon Kagaku Gijutsu Rommei, 1951). This is an edited version of lecture notes transcribed by Japanese participants. Proceeds from sales of this book were donated by Dr. Deming to the Japanese Union of Scientists and Engineers, the group which had sponsored his visit. The funds were used to establish the Deming Prize.
5. For an accurate description of the Deming red bead experiment and his interpretation see Mary Walton, *The Deming Management Method* (New York, NY: Dodd Mead & Co., 1986), Chapter 4; and Andrea Gabor, *The Man Who Invented Quality* (New York, NY: Times Books, 1990).
6. The particular framework used for the diagnosis was an organizational model of Nadler-Tushman. David Nadler and Michael Tushman, “A Model for Organizational Diagnosis,” *Organizational Dynamics* (Autumn 1980). During the seminar we made the point that alternative diagnostic frameworks existed and that it was more important that one be used than which one. Our main purpose was to methodically expose all the elements of the enterprise that affected quality and that conversely would be affected by a move toward total quality management.

7. Some months earlier, Mr. Fetterolf had been on a benchmarking visit to Japan to review advanced manufacturing techniques. While he and the other participants learned and were inspired by the experience, nothing concrete had resulted from the Advanced Manufacturing Task Force. This failure was indeed well known to, and on the minds of, several Quality Task Force members.
8. The history of the Xerox effort is now reasonably well documented in the public literature. See, for example, the story as recounted by two of the key participants, David Kearns and David Nadler, *Prophets in the Dark: How Xerox Reinvented Itself and Beat Back the Japanese* (New York, NY: Harper Business, 1992). Jacobsen and Hillkirk describe in detail the challenge from Japan and some of the personalities involved. Gary Jacobson and John Hillkirk, *Xerox, American Samurai* (New York, NY: Collier Books, 1986). On the Xerox quality effort, see Chapter 7 in Gabor, *op. cit.*, which is, by the way, much more critical of the Xerox approach.
9. Yotaro Kobayashi, "Quality Control in Japan: The Case of Fuji-Xerox," *Japanese Economic Studies* (Spring 1983), pp. 75-104.
10. Most of the quality gurus testify to the large proportion of problems that are "due to the system." See, for example, the books of Deming and Juran. There has been no scientific documentation of this contention. The author is tempted to make his estimate far higher in some industries and far lower in others. In part the issue is whether processes are "in control." W. Edwards Deming, *Out of the Crisis*, MIT-CAES, Cambridge, 1986. Joseph M. Juran, *Juran on Planning for Quality* (New York, NY: The Free Press, 1988).
11. A sense of the public response to the Alcoa quality initiative and to Paul O'Neill's leadership can be gotten from Stewart, *op. cit.*; Thomas F. O'Boyle and Peter Pae, "The Long View: O'Neill Recasts Alcoa With His Eyes Fixed On a Decade Ahead," *The Wall Street Journal*, April 9, 1990, pp. A1 and A4. Over this period, Alcoa was repeatedly listed as first among the Metals Industry in *Fortune* magazine's annual "America's Most Admired Corporations" beauty contest. (About which a senior Alcoa manager observed, "That's real nice, but the industry sucks.") Over the two-year period 1989 to 1991, Alcoa's common stock earnings were 28.5% as compared to -28.3% for Alcan and 12.2% for Reynolds.
12. Here, Paul O'Neill is predicting a dire future unless significant anticipatory action is taken. One is reminded of a 1939 address by Winston Churchill to the House of Commons castigating the British government for its tardy and ineffectual response to the threat of Nazi Germany. It was a much more crucial and historical issue that Churchill faced then, but his words ring true in this contemporary industrial context as well. He said, "When the situation was manageable it was neglected, and now that it is thoroughly out of hand, we apply too late the remedies which might then have effected a cure. There is nothing new in the story. It is as old as the Sibylline books. It falls into that long dismal catalogue of the fruitlessness of experience and the confirmed unteachability of mankind. Want of foresight, unwillingness to act when action would be simple and effective, lack of clear thinking, confusion of counsel until the emergency comes, until self-preservation strikes its jarring gong—these are the features which constitute the endless repetition of history."
13. A Hall cell is the electrolytic device in which the smelting of aluminum is done. It is essentially a large carbon lined bathtub. An operating efficiency issue is how long such a pot can be run before it must be shut down and relined with carbon—this time is called "pot life." Alcoa was founded by the cell's inventor, Charles Martin Hall.
14. For a development of this line of reasoning, see Masaaki Imai, *Kaizen: The Key to Japan's Competitive Success* (New York, NY: Random House, 1986).