As an offshoot of Los Alamos Laboratory, the far more renowned secret installation where the atomic bomb was built, Sandia National Laboratories came into being concurrently with the beginnings of the Cold War. It was originally the Z Division of Los Alamos, the engineering and field testing group, which was established in 1945 at Sandia Base, an Army installation near Albuquerque, some 100 miles south of Los Alamos. From this small engineering group formed in the waning days of World War II, Sandia grew impressively as international tensions increased in the 1950s and 1960s. By the 1970s, it employed some 7000 people in its main facility in Albuquerque and another 1000 in Livermore, California. It also operated test ranges in Tonopah, Nevada and Kauai, Hawaii.

Unlike Los Alamos whose eminent scientists from the beginning had a strong sense of the historical significance of the task they were undertaking, the young Manhattan Project engineers and technicians who arrived at the bleak, wind-swept military base a part of which formerly had been Oxnard Field, Albuquerque's old municipal airport, had no such lofty pretensions. In the words of Jack Howard, who was part of this first group and later a Sandia vice-president, "Given the confusion of what we were really all about, it shouldn't be surprising
that, at least for me, it wasn’t too easy to imagine [being] ‘engaged in a historic endeavor’; like doing WHAT? Anyway, I was in my mid-twenties and probably only gave passing thought to such weighty matters.”¹

The decision to physically separate weapons research and development from Los Alamos’s nuclear design groups was made in the spring of 1945 by Robert Oppenheimer who explained, “We wished to make provision for the continuation of weapons development, especially in its non-nuclear aspects, at a site convenient to Los Alamos--as Wendover was not--immediately accessible to aircraft and air strips, and not itself part of Los Alamos.”² A strong driver in the decision was no doubt the cramped and uncomfortable conditions in Los Alamos itself, and the attendant lack of water and other amenities. Neighboring Santa Fe, the state capital and today a trendy spot favored by artists, skiers, and Hollywood types, had limited facilities and even though a good two-lane paved road connected it with Los Alamos, the commute was still tiring. And Albuquerque, with its 30,000 inhabitants, was a veritable metropolis by comparison albeit still relatively isolated.

¹. W.H. Howard to author, February 7, 1997, e-mail

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Albuquerque's geographical isolation but much more convenient military air facilities made it an ideal site for Los Alamos's Z Division, named after the first letter in the last name of its group leader Jerrold Zacharias. The war years had seen considerable activity at the Army Air Corps base after the Secretary of War appropriated 1,100 acres of land in 1942 on Albuquerque's east mesa, which included Oxnard Field. It was in this era that the term “Sandia Base” came into unofficial use by the construction engineers who were erecting the facilities.

To briefly sketch out the sequence of events, Z Division of Los Alamos was moved to Sandia Base in 1945. On April 1, 1948, Z Division was reorganized as the Sandia Branch of Los Alamos. At this juncture, the personnel strength of the Sandia Branch was 470, although by a vigorous recruiting effort the number of employees exceeded 1000 by the fall of 1948. A $25 million construction program began to build permanent structures to replace the flimsy buildings erected by the Manhattan District. Norris Bradbury, director of Los Alamos, was disturbed by Sandia's rapid expansion, which gave the branch a staff equal to that of the parent laboratory. The University of California also shared this concern, concluding that Sandia activities were “...no longer appropriate to an academic institution” and requested that the facility be transferred to someone else's purview. Atomic Energy Commission director David Lilienthal invited a Bell Telephone executive, Mervin J.


4. Letter, David E. Lilienthal to Leroy Wilson, June 24, 1949, in ibid
Kelly, to survey the entire Los Alamos operation. His recommendation for Sandia was that it would be more effectively managed as a production-type organization under industrial management. The AEC then decided to ask the Bell System to assume management of Sandia, which prompted Harry Truman’s brief letter of May 13, 1949, to AT&T president Leroy Wilson asking him to assume direction of the laboratory. This letter contained the sentence, “In my opinion you have here an opportunity to render an exceptional service in the national interest,” the last part of which has become Sandia’s motto.

Thus 1949 initiated Bell System/AT&T stewardship of Sandia Laboratories on a no-profit, no-fee basis, which continued until 1993 when Martin Marietta (now Lockheed Martin) was chosen as the new contractor. Specifically, Western Electric incorporated Sandia Corporation, a wholly owned subsidiary, to manage Sandia. This was because certain policies, such as 24 days annual leave, had been established at Sandia under University of California management which AT&T did not want to extend to Western Electric, its manufacturing arm which was directly managing Sandia. AT&T saw Sandia’s role as primarily production, which is why it sent a Western Electric management team headed by George Landry, Sandia’s first president from 1949 until 1952.

Consequently, there was a disconnect between the Western Electric transferees and most Sandia employees as to Sandia’s basic mission. In Jack Howard’s colorful phrasing, “...we stepped off on the wrong foot....Even before time itself began to erode the manufacturing-mission image for Sandia, it dawned on a few...probably most notably Mervin J. Kelly and perhaps Don Quarles...that the role that needed to be filled
was one of providing engineering expertise to AEC....It was probably Kelly who substituted physicist Quarles for factory-manager Landry."5 The second person that Howard refers to is Donald Quarles, who succeeded Landry as president in 1952. Quarles came from Bell Labs where he had been supervising the Nike missile electronic-guidance project. He reorganized Sandia to emphasize engineering research over production in conformance with an AEC directive that Sandia no longer would produce war reserve weapons although it retained final oversight on their production. Quarles left Sandia to become Secretary of the Air Force, and then Deputy Secretary of Defense. He died of a heart attack in 1959 on the day President Eisenhower was going to appoint him Secretary of Defense.

By the 1950s, propelled by Korean War pressures, Sandia’s work schedule was increased to six days a week under intense, secretive conditions. The staff was about 4,000 with an average age of 32 and most of its middle managers were electrical engineers. Toward the end of the decade, Kimball Prince, the corporate attorney from 1955 to 1959, compiled a short history of the founding of Sandia Corporation. According to Prince, the compilation was suggested to him by Siegmund “Monk” Schwartz, president of Sandia Laboratories from 1960 to 1966. So the first initiative to document Sandia’s history came from upper management, although the end product was never published. Prince’s

history consisted of a chronology beginning with Los Alamos in 1943 and ending with AT&T's contract with the AEC to manage Sandia in 1949. This was followed by a brief narrative of these events and copies of letters between AEC and Bell System executives. The typewritten document was completed in June 1960 and filed away in the legal department's files until it was transferred to the history archives in the 1980s.

The next phase of the chronicling of Sandia's history came shortly after Prince's modest effort. Frederic C. Alexander, due to what is called nowadays a "restructuring," found himself with no specific assignment. Sandia's comptroller and Alexander's friend, R. G. Luckey, brought him into his organization and suggested that Alexander write a history of the Laboratory. The result was a 70-page unclassified illustrated booklet titled "History of Sandia Corporation through Fiscal Year 1963"--an appropriate comptroller-type title. Alexander was able to tap the memories of some of the individuals originally involved with Sandia, such as Robert Oppenheimer and General Leslie Groves, director of the Manhattan Project, who supplied information on early activities at Sandia. Captain Shelton A. Musser of the Manhattan Engineer District who was involved with the original selection of the Sandia site also supplied information. James Oxnard and Frank Speakman, founders and operators of the old Albuquerque Municipal Airport, were still around to provide first-hand information. Mervin Kelly, who recommended that Sandia be placed under industrial management, also reviewed Alexander's draft.

Alexander's most important accomplishment was the writing of a series of classified weapon histories in which he was assisted by Phillip Owens. A total of 51 reports were produced of which Alexander authored 46.
By the time that Alexander completed his general history, the role of Sandia vis-à-vis the other weapons labs, Los Alamos and Lawrence Livermore—founded in 1952 as competitor to Los Alamos, was well defined. Los Alamos and Lawrence Livermore designed the high explosive/nuclear system package, while Sandia designed the rest of the nuclear weapon. In essence, Sandia “weaponized” the nuclear systems designed at its partner laboratories. To offer direct support to Lawrence Livermore, Sandia established a second lab across the street in 1956. This move served to reassure Lawrence Livermore management that Sandia did not consider the prestigious Edward Teller-inspired California lab as second fiddle to what some of them might have perceived as Los Alamos’ top banana standing.

All of these activities were carried out under the highest security considerations, which shaped the AEC’s and consequently Sandia management’s policy toward any historical documentation of Sandia. For instance, Alexander’s booklet was not published, that is, it was not distributed as a formal unclassified Sandia report, which would have made it available to the public. John Shunny, editor of the company newspaper, the Lab News, from 1968 to 1982, described the situation succinctly: “...how do you talk about the company product when that product is a highly classified nuclear weapon?...So sensitive was the subject in the 1950s that each draft was read aloud by Superintendent Harold Sharpe to President George Landry, cover to cover, bowling scores and all. ‘Strike that!’ Landry would exclaim, and the reading continued. Under this regimen, the Lab News was long on news of employees’ activities in the community, hobby stories, and Coronado Club activities,
but short on ‘hard’ news of weapon programs.”6 Landry subscribed to the philosophy that the best public relations year is one in which the firm is not mentioned in the newspapers. If so, 1950 was a very good year. Although the New York Times briefly referred to Sandia in 1948 and 1949, it did not mention the Lab at all in 1950. This anonymity was reflected in the title of a Popular Mechanics article of 1969 which referred to Sandia as “The Super Lab That Nobody Knows,” and persevered until the present when Richard Rhodes in his 700-page tome, Dark Sun, had just one reference to “Sandia Base in Albuquerque.”7

Thus it was a combination of several factors that inhibited the establishment of an active history program at Sandia in the early years: the deliberate maintenance of a low profile because of the highly secret nature of the weapons work; the relative youth of the work force; and the engineering background of upper managers which tended not to embrace a historical sense. A related factor was that many of the World War II veterans and Z Division people were still young and in their active work years. The accumulation of a substantial number of retirees disposed to reflect back on their careers and the larger significance of their work was still some years in the future.


Archival resources were also problematical. Even though there was a reportedly well stocked records and publication center\textsuperscript{8} by the late 1950s when Frederick Alexander started his historical research, the drawback of many corporate archives is that a system of requiring different organizations to systematically provide their records to a central location is generally not implemented. The handling and disposition of classified records are of course governed by strict procedures, but unclassified documents often stay in someone’s file cabinet where after some years they may be discarded. And if the individual has saved historically significant documents, they may come to reside in the corner of a garage. In the 1950s and 1960s, Sandia had an effective system for the archiving of technical files, but not for administrative documents. In fact, the corporation would periodically encourage “file cleaning” days with kudos for those organizations that discarded the most old records. Sandia supplied every engineer and scientist with a laboratory notebook to document the development of technology. These notebooks include noteworthy examples of how patent information was collected, used, and released to the public. This was required by the 1949 contract between the AEC and Western Electric according to which the AEC determined whether a patent application should be filed for an invention or discovery resulting from a Sandia employee’s work.

But the establishment of historical archives per se would have to wait until the middle 1980s. In the interim, Sandia’s inactive history program

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\textsuperscript{8} According to Philip Owens who worked with Frederick Alexander on several weapons histories in the early 1960s. Interview, February 11, 1997.
was placed under the auspices of the company newspaper, the *Lab News*, whose editor was acting historian. There was a certain logic to this, because the *Lab News* after 1970 did constitute a valuable resource for the technical and administrative history of Sandia. This was due to President John Hornbeck (1966-1972) who introduced a new openness to the company newspaper. Throughout the 1950s and 1960s, anyone perusing the *Lab News* would have thought that the principal activity of Sandia employees was in improving their bowling scores, coaching Little League teams, and pursuing various hobbies. Still, the newspapers of these early years contained a great deal of information on promotions, professional development, and community service. Some work-related stories were published, but nothing relating to the actual weapons work. By the late 1960s, the AEC was relaxing its restrictions, and as

John Shunny, editor of the *Lab News* at the time describes the change:

> We could actually refer in print to, say, the Mark 28 and identify engineers working on the program. Later, photos revealing the external appearance of various weapons were permitted.

*The beginnings of the modern and more open Lab News can be dated to September 1970, when President John Hornbeck consented to a state-of-the-Labs interview, to be published in January (and a tradition ever since). Short of information actually classified, Hornbeck went along with the no-holds-barred format, a startling (at the time) démarche when compared to his predecessors. During the 1970s, articles on weapons and components, field tests, materials research, and other weapon-related activities became commonplace in the Lab News. This openness continues today and includes as well a remarkable candor on how the business is being run.*

By 1981 when George Dacey became president, Sandia had already experienced wrenching changes. In the early 1970s, defense budget reductions resulted in a layoff that led to years of litigation which was decided against Sandia. But the energy crisis and national concerns about energy use and dependence on foreign sources encouraged the pursuit of alternative energy technologies. Sandia responded with research on solar and wind technology, photovoltaics, enhanced fossil fuels recovery, and fusion development. Research on central receiver

technology led to the deployment of Solar One, the first commercial solar-electrical plant near Barstow, California and its successor, Solar Two. Sandia was now engaged in many non-weapon programs of potential benefit to the average American and Dacey decided that this story should be told to the public.

Another driver for preserving the corporate memory was the completion of weaponization of three complex weapons systems: the B83 strategic bomb, the W84 for the ground-launched cruise missile, and the W85 for the Army’s Pershing II missile. All three systems were moving into production by 1983 and according to VP Tom Cook (now retired), “We had not put weapons into production for a long time...and both we and the production complex had really forgotten the way we used to do things and we had to relearn those.” This was because many of the Sandians who had led the early weapon projects had transferred to other areas or were retired, taking with them their many years of hard-earned knowledge and skills.

Dacey was personally interested in preserving the history of Sandia while many of the participants were still around. He acted in part upon the suggestion of his vice-president, Jack Howard, of initiating an oral interview and history program. Dacey also acted on a recommendation of the American Institute of Physics which urged the national labs to start history programs. The first step was to hire a historian, and a recommendation came from director John Crawford. His friend and neighbor was Necah Furman, a history PhD from the University of New Mexico and author of a biography of William Prescott Webb, a famed Texas historian. Although Furman had no background in the history of science and technology or prior knowledge of Sandia, she was hired in
1982 to initiate the history program. Her initial job description was technical writer because Sandia had no job classification for a historian, although eventually a historian's slot was created for her.

The first and lingering difficulty that Furman had was that even though she enjoyed support from top-level management, none was forthcoming from middle and lower level management, who considered history as a "fluff" project. The peripatetic history program was initially housed in the Employee Communications Department, which published the Lab News. Then it was moved to Tech Writing and finally to Records Administration. To add to her woes, Furman also had to endure the resentment of a Sandia employee with some post-graduate coursework in history who felt he should have been made historian.

Dacey instructed each directorate to appoint a history representative who would be responsible for writing histories of their organizations. They would locate and identify records, many of which had ended up in staff members' homes because Sandia had no archives. For instance, one of the best historical packages was compiled by the Facilities contact because he cared about saving the information and buildings and dates of construction.

Together with her assistant, Tonimarie Huning, Furman initiated a history program that included the creation of history archives, coaxing biographies from all managers from department and above, doing taped interviews with employees and retirees (including "outtake" interviews--of outgoing employees), and, finally, a published history of Sandia. Her plan was to write the histories in 10-year increments, so that as one
book was published, ongoing research would be folded into the following volume.

The book, entitled *Sandia National Laboratories: The Postwar Decade,* was published in 1990 by the University of New Mexico Press after Sandia agreed to buy back about 2000 copies of the 3,433 print run at $26—the cost of producing one copy was $7.50. Just prior to publication, Furman’s immediate managers sent the manuscript to be reviewed by a retired AT&T lawyer. The attorney recommended against publication but a compromise was worked out wherein the book would include a disclaimer by AT&T. The published book received some criticism for retelling the story of the Manhattan Project and the Trinity test, although Furman’s narrative included personal accounts of participants who would later be prominent Sandians—Glenn Fowler, Bob Henderson, and others. Lengthy stretches were rather dry, especially those dealing with administrative matters.\textsuperscript{11} One reviewer, calling the book a corporate memory, likened it to a “Sandia family album, full of pictures and lists of names but to no apparent purpose.”

After Dacey retired in 1986, management support for the history program waxed and waned. In 1989, it was moved to the Records Management organization whose supervisors did believe in it but had to cajole corporate funding. After Furman left Sandia in 1991, President Al Narath revived the moribund history program. There was one historian of brief tenure before an outside historian was hired on a two-year contract from 1994 to 1996. This was Leland Johnson who, among other

\textsuperscript{11} For these and other details about the Dacey history program, I am indebted to Tonimarie Huning, interview, February 7, 1997.
institutional histories, had published a history of Oak Ridge National Laboratory. Johnson drafted a general history of Sandia from its beginnings to the middle 1990s, which is scheduled for publication in May as a Sandia publication, and will be on sale to the public through the National Atomic Museum. In the editing of this book, over 100 retirees and employees were asked to review portions of the draft thus ensuring greater accuracy as well as their moral support. Johnson also wrote a short illustrated history of Tonopah Test Range.

In 1996, shortly after I became corporate historian, budget cuts eliminated funding for the history program which also would have eliminated Rebecca and me. So we instituted a “history for hire” strategy where different organizations were approached to support historical documentation of their activities. The major current projects are a history of Sandia’s role as technical and scientific advisor to the Waste Isolation Pilot Program near Carlsbad, New Mexico--Sandia’s most visible project in the last twenty years. Work is ongoing on a history of Tech Area II, built in 1949 for the assembly of high-explosive components, and which is due for demolition in the next couple of years. We will seek funding for a history of Sandia Laboratories in Livermore, California (now referred to as Sandia California). And a sequel to the Furman book is planned for 2001, to encompass the period from 1956 to the early 1970s.

This brief overview of Sandia’s history programs proves, need it be said, that such a program needs unequivocal, consistent support from upper management, something that has not always been forthcoming. In just a couple of years, our Directorate had four changes of management. Each of these iterations required “educating the leadership” on the importance of a history program. Other delicate issues we’ve had to deal with,
especially in the editing of the forthcoming Sandia General History, are folks, both retired and on-roll, with their own agenda based on personal animosities dating from twenty years ago. We've had to spend a lot of time juggling budgets and justifying our existence instead of doing history.

It is evident that doing any corporate history is different than toiling in academia. Academic historians look upon us, and quite justifiably, as a cheering section for corporate management's point of view (which is often not monolithic), or at least not to deviate too far from it. This is not surprising since they are paying for the history program and our work has to undergo an internal review process. The celebratory tone in which our accomplishments are couched tends to gloss over the nature of the weapons that Sandia worked on, the controversy over nuclear testing, and the increasing public distrust of government in recent decades. The early Sandians are generally portrayed as having a strong sense of camaraderie, urgency, and mission, although personal animosities, as I soon discovered in talking with some retirees, are never far below the surface. The "sense of mission" can also be seen as an unreconstructed Cold War rigidity that even recent reassessments of the post World War II era in most cases has failed to modify.

These are some of the issues that must be dealt with in documenting the historical role of the national labs. In 1999, Sandia will celebrate its 50th anniversary and it is important that the story of the very real accomplishments, as well as some of the warts, of the early generations of Sandians be preserved and transmitted to the new generation. And it is important to make this history available to social historians as well as historians of science and technology, because the national labs have
significantly impacted the economies and societies of the areas in which they've been located. This is especially true of New Mexico, an impoverished and sparsely populated state which found itself the birthplace of the nuclear age. Sandia, being in Albuquerque, the state's largest city, has had a greater impact on its community than Los Alamos has had on its surrounding area. These are just some of the broader issues that a Sandia history will start to address and, I hope, inspire both regional and national academic historians to examine in all their political, scientific, economic, and social ramifications.