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A Brief History of Sandia's National Security Missions

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Abstract

To help members of the workforce understand what factors contribute to Sandia National Laboratories' national security mission, the authors describe the evolution of Sandia's core mission and its other mission components. "The mission" of Sandia first as a division of Los Alamos and later as Sandia Corporation underlies our core nuclear weapon mission of today. Sandia's mission changed in 1963 and twice more in the 1970s. This report should help staff and management appreciate the need for mission evolution. A clear definition and communication of a consistent corporate mission statement is still needed.

Acknowledgments

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Table of Contents

Nomenclature 6
Background 7
Explanation of Terms 7
The History of Sandia's Mission 9
The Original Mission—NW Ordnance 9
The First Significant Mission Expansion—Defense Work for Others 10
The Second Significant Mission Expansion—Energy & Environment 10
The Third Mission Expansion—National Security 12
The Primary/Core Mission—Nuclear Weapons 12
And Then There Was One—Overall National Security Mission 13
Putting it All Together 13
Conclusion 17

Figures

Figure 1. Timelines of World Events, Sandia Missions, and Laboratory Oversight Agencies 14
Figure 2. Percentage of Weapons Activities to SNL Total Operating Cost 15

NOMENCLATURE

AEC	Atomic Energy Commission
DHS	Department of Homeland Security
DOE	Department of Energy
ERDA	Energy Research and Development Administration
FY	fiscal year(s)
IW	Interagency Work
LM	Lockheed Martin
NFE	Non-Federal Entity
NNSA	National Nuclear Security Administration
NW	nuclear weapon(s)
R&D	research and development
SNL, Sandia	Sandia National Laboratories
SRAB	Sandia Research Advisory Board
WFO	work for others

BACKGROUND

A 2012 Research Environment Study[1] revealed that a line-of-sight from staff work assignments to the mission was not clear to many Sandians. Staff and managers interviewed expressed attitudes, sentiments, and beliefs regarding and questioned issues around how is research being performed with the mission in mind; what work is performed in support of the mission; has the mission changed and why; does the nuclear weapon (NW) part of the mission seem to be less valued; and so forth. When asked, some staff might struggle to answer how their work relates to the mission. This lack of line-of-sight from work to mission was also revealed in the outcome of the 2012 LM (Lockheed Martin) Voice.[2]

During this same timeframe, the Sandia Research Advisory Board (SRAB) met, and its members pointed out that "the Mission" should drive the Research Foundations and the Research Challenges[3] that Sandia proposed to undertake. One of five Sandia Strategic Objectives is to amplify our national security impact.[4] SRAB viewed that this objective needed clarity, providing more intent. Specifically, what are we going to do and how does the work support the NW mission or is it in addition to the NW mission?

This report provides the history of Sandia's mission and mission statements from past to present to help staff and management understand the evolutionary nature of our mission. The surprises may be that the national security mission is not a post-9/11 mission and that Sandia performed Work for Others (WFO) long before the end of the Cold War; neither are a product of current events.

Explanation of Terms

A mission is a specific task with which an entity is charged, or it is a pre-established purpose or objective. Think of "the mission" as an important assignment. Moreover, think of the mission as a verb—mission is what we do.

For a number of years, corporations have prepared mission statements, which are written declarations of an organization's purpose and primary objectives, including which markets will be served and how. A mission statement communicates a sense of intended direction to the entire organization.

Our research into the term "mission statement" places its origin in the 20th century, being used as early as 1960 by the National Academy of Sciences. In the U.S., the military, and academia were among the first to apply the term to explain their roles and functions. Obtaining a list of mission statements for Sandia in the early decades of its existence would be a challenge as the Lab originated in 1945—before the time when common business practices included the development of a mission statement. Regardless, the mission of Sandia from its inception until today can be found in the corporate literature.

[1] Mike Moulton, Celeste A. Drewien, and Jonell Samberson, "Research Environment Study," Sandia National Laboratories presentation, SAND2014-4824, May 2, 2014.
[2] Jim Danneskiold, "We heard your voice: Sandia leaderships implements measures to address concerns raised in LM voice employee survey," *Sandia Lab News*, Sandia National Laboratories, February 11, 2013, https://info.sandia.gov/newscenter/interactive/index.php/2013/02/voice-3/.
[3] Sandia Research Advisory Board, Spring Meeting Report, Sandia National Laboratories, April 9-11, 2013.
[4] Sandia National Laboratories. 2012. "Sandia's 5-year plan, The official FY12-FY16 Strategic Plan," http://strategicplan.sandia.gov/.

THE HISTORY OF SANDIA'S MISSION

This section provides a history of Sandia with respect to mission assignments received in official documentation or as articulated by executive management.

The Original Mission—NW Ordnance

In 1945, "Sandia originated as a single-mission engineering organization for nonnuclear components of nuclear weapons."[5] Its mission was to provide the ordnance,[6] testing, and assembly of nuclear weapons. Sandia was the Z Division of Los Alamos Laboratory.

In 1949, Sandia Corporation was established.[7] The need to "redesign the bomb into a field weapon could not be done in a laboratory alone, but in a production center…with factory management." The University of California, manager of Los Alamos, became increasingly uncomfortable about being associated with the engineering aspects of NW work. Consequently, President Truman wrote a letter to AT&T's president informing him of the Atomic Energy Commission's (AEC) intent to ask AT&T to manage Sandia Laboratory. President Truman opined that AT&T/Westinghouse had "an opportunity to render an exceptional service in the national interest;" AT&T accepted the task and the opportunity. Although the statement applied to AT&T, we at Sandia have adopted the phrase as our vision statement—(*We, Sandia, provide) Exceptional service in the national interest*.

Los Alamos Laboratory was released from management responsibilities for Z Division, and Sandia Corporation was founded with Western Electric assuming management. Sandia Corporation's Certificate of Incorporation stated the purpose of the new corporation was "to engage in any kind of research and development, and any kind of manufacturing production and procurement to the extent that lawfully may be done and to enjoy all the powers conferred on corporations organized under the general corporation laws of the State of Delaware."[8]

An early mission statement read: Sandia is primarily responsible for incorporating the explosive and nuclear components into the weapons designed for specific military uses, and for producing and stockpiling the complete weapons in accordance with schedules furnished by the AEC.[9] In 1952, Sandia President Donald Quarles stated, "Our job is to study these possibilities [new concepts concerning the kinds, sizes, and shapes of these weapons] very carefully and to lay information before the Atomic

[5] Sandia National Laboratories. 2013. "History: A Bold Heritage." http://www.sandia.gov/about/history/.
[6] Ordnance is defined as military supplies including weapons, maintenance tools, and equipment. It is also the procuring, distributing, and safekeeping activity for these items.
[7] Necah S. Furman, *Contracting in the National Interest: Establishing the Legal Framework for the Interaction of Science, Government, and Industry at a Nuclear Weapons Laboratory*, SAND87-1651, Albuquerque, NM: Sandia National Laboratories, April 1988.
[8] Frederic C. Alexander, Jr., *History of Sandia Corporation through Fiscal Year 1963*, Albuquerque, NM: Sandia Corporation, 1963, p. 24.
[9] Annual Report of the Board of Directors to the Stockholders for the Year ending December 31, 1950, Albuquerque, NM: Sandia Corporation, May 14, 1951.

Energy Commission and the military to enable them to make wise decisions as to the lines of development to be pursued."[10]

Sandia's mission was to convert the Los Alamos nuclear explosive systems into deliverable weapons. In 1955, the AEC expanded Sandia's mission execution to include providing ordnance engineering to Lawrence Radiation Laboratory at Livermore, now Lawrence Livermore National Laboratory.

The First Significant Mission Expansion—Defense Work for Others

Political, social, economic, technological, and demographic needs and/or changes can drive mission change. From November 1958 to September 1961, an informal nuclear testing moratorium was observed; subsequently, the Limited Test Ban Treaty, banning NW tests in the atmosphere, was signed in 1963. Given the pending moratorium, the U.S. "rushed to complete weapon development"[11] transferring a large number of NW designs into Production Engineering and/or full-scale production. The AEC planned reductions; and, Sandia maneuvered to avoid reductions-in-workforce and perhaps even closure. Initiatives, such as adding new research laboratories and establishing liaisons with the Air Force, Navy, and Advanced Research Projects Agency, led to the first expansion of our mission beyond NWs.[12] By 1963, Sandia's mission expanded to reimbursable projects to include enhanced use control; arms control treaty verification; space missions; conventional weapons; and seismic sensors used in Vietnam. Despite this mission expansion, "the principal role of Sandia Corporation will continue to be the improvement and maintenance of the nuclear arsenal and the upgrade of nuclear ordnance technology. In addition, Sandia will carry on a number of weapon- and non-weapon-related activities."[13]

"Reimbursable work" is the early terminology used for what we today term WFO; today, WFO work may be referred to as Interagency Work (IW) or Non-Federal Entity (NFE) work. WFO work contributed 15% of Sandia's total budget by 1966. Important caveats to WFO are still in place. Head-to-head competition with the domestic private sector is prohibited; the evaluation and selection of work must be performed through a merit or peer review process using pre-established general selection criteria; the work must have importance to the National Nuclear Security Administration (NNSA), being consistent with or complementary in nature to NNSA missions and the labs; and the work must not adversely impact programs assigned to the labs or create a detrimental future burden on NNSA resources.

The Second Significant Mission Expansion—Energy & Environment

Another expansion of the mission to encompass energy research began in the early 1970s. Sandia ended the decade of the 1960s by delivering on special and reimbursable programs simultaneous with the delivery of and maturing of many NW programs and activities.[14] "From 1970 to 1974, national

[10] Donald A. Quarles, "Sandia's Ordnance Task" speech delivered at the Atomic Energy Commission briefing at Las Vegas, Nevada, 4/21/1952: Speeches by Sandia Management, Collection 76, Sandia Corporate Archives.
[11] Leland Johnson, *Sandia National Laboratories: A History of Exceptional Service in the National Interest*, SAND97-1029, Albuquerque, NM: Sandia National Laboratories, 1997, p. 83.
[12] Johnson, p. 117.
[13] Sandia Corporation Annual Program Statement, Albuquerque, NM: Sandia Corporation, June 24, 1965.
[14] Johnson, p. 151.

budgets for research and development declined by nearly a third."[15] Federally funded nondefense[16] R&D had undergone a 22 percent reduction from 1966 to 1975 due to the costs of the Vietnam War.[17] This reduced funding resulted in three personnel layoffs at Sandia in 1970, 1971, and 1973.[18]

On the heels of the 1967 Oil Embargo, the 1970s can be characterized as a decade in which an energy crisis influenced worldwide economies. In 1971, Congress amended the Atomic Energy Act of 1954, expanding the AEC's purview to include R&D on "the preservation and enhancement of a viable environment by developing more efficient methods to meet the Nation's energy needs." [19]

The Energy Reorganization Act of 1974[20] abolished the AEC and created the Energy Research and Development Administration (ERDA).[21] In 1975,[22] Sandia was named as one of eight multi-program laboratories of ERDA. ERDA was mandated to conduct energy research, development, and demonstration projects, and to contribute to the commercialization of appropriate energy technologies,[23] which allowed Sandia to expand its mission in energy research and technology. This modification to Sandia's mission is the first mention of activities that contribute to commercialization.

Creation of the U.S. Department of Energy (DOE) in 1977 [24] prompted a refinement of this new mission. Energy and environment missions expanded into new areas of technical research, including coal gasification and oil shale energy, advanced drilling and down-hole steam technology, and nuclear wastes. Sandia was successful in adapting to this broadened mission. "By 1976, energy and reimbursable programs had grown to approximately a quarter of Sandia's annual budget."[25] Since the mid-1970s approximately 50% of Sandia's annual budget has resulted from WFO.

In 1980, Morgan Sparks stated that "A majority of our staff continues to pursue our central mission, the development of the non-nuclear portions of nuclear weapons, and we expect this to continue…We continue to emphasize energy programs which utilize and strengthen the technologies we apply in the defense programs."[26]

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[15] Ibid., p. 161.
[16] Although Sandia's work included NWs, its funding was not part of the defense budget.
[17] National Academy of Sciences (U.S.) Committee on Criteria for Federal Support of Research and Development, *Allocating Federal Funds for Science and Technology,* "Supplement 1: The Evolution and Impact of Federal Government Support for R&D in Broad Outline," Washington DC: National Academies Press, 1995, http://www.ncbi.nlm.nih.gov/books/NBK45556/.
[18] Johnson, p. 167.
[19] U.S. Congress, Atomic Energy Commission Appropriations Authorization Act, Public Law 92-84, Section 201, 92nd Congress, August 11, 1971.
[20] U.S. Congress, Energy Reorganization Act of 1974, Public Law 93-438, 93rd Congress, October 11, 1974.
[21] Executive Order 11834, January 5, 1975.
[22] Johnson, p. 188.
[23] U.S. Congress, Federal Nonnuclear Research and Development Act of 1974, Public Law 93-577, 93rd Congress, December 12, 1974.
[24] Jimmy Carter: "Executive Order 12009 --Department of Energy," September 13, 1977.
[25] Johnson, p. 187.
[26] Institutional Plan Team, "Mission Statement Evolution," white paper, 2000.

The Third Mission Expansion—National Security

ERDA established six program areas (fossil energy; nuclear energy; solar, geothermal, and advanced energy systems; national security; environment and safety; and conservation). Unlike the preceding mission modifications, no crisp statement of what this "national security" mission requires of Sandia was found when reviewing the literature.

The impact of these two significant mission expansion episodes in the 1970s led to the promotion of Sandia Labs to Sandia National Laboratories in 1979.

An example of Sandia's national security mission is taken from the FY 1985-2000 Implementation Plan [27] "The primary mission of Sandia National Laboratories is to be a national resource of scientific, technical, and engineering capabilities focused on execution of its primary national security mission. It undertakes multidisciplinary fundamental and applied research and development activities necessary to maintain a leading position in the broad range of scientific and technical fields required for this mission, and maintains close interaction with scientific personnel in universities and industry."

The end of the Cold War and the signing of the Strategic Arms Reduction Treaty in 1991, once again focused Sandia's attention on avoiding stagnation and personnel reductions. Other world events, such as bombings and terrorist attacks, had directed attention to homeland security; and, the national security mission area was rearticulated after the creation of the Department of Homeland Security (DHS) in the wake of the terrorist attacks on September 11, 2001. The Homeland Security Act of 2002[28] authorized the DOE laboratories and sites to accept and perform work for the Secretary of DHS in a reimbursable mode; however, the work was to be performed on an equal basis to other missions at the labs and not on a non-interference basis[29] with other missions of the labs.

The Primary/Core Mission—Nuclear Weapons

With the end of the Cold War, Sandia considered that its weapons work might decline, and it recognized that it could respond to other nationally important problems. Sandia began strategic planning, developing a vision statement, and managing change. Yet, the message that SNL's core or primary mission is NW work was articulated just after these mission expansion episodes and continues to be articulated as such today.

In the *Fiscal Years 1980-1985 Institutional Plan,*[30] Laboratory Director Morgan Sparks stated, "The central mission of Sandia Laboratories is and will remain the development of the non-nuclear portions of nuclear weapons." In the 1980s Sandia became DOE's lead laboratory for safeguards and security. Sandia President George Dacey explained in 1986 that Sandia's primary mission was NW research,

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[27] George C. Dacey and Irwin Welber, in *Sandia National Laboratories' FY 1985-2000 Institutional Plan*, "Laboratory Mission," p. 4.

[28] Homeland Security Act of 2002, 6 USC § 189, Title I-Department of Homeland Security, Section 309 "Utilization of Department of Energy National Laboratories and Sites in Support of Homeland Security Activities, 2002. https://www.dhs.gov/homeland-security-act-2002.

[29] This is being interpreted as DHS work has an equal footing with DOE work at Sandia, ensuring that DHS work is not done only when it does not interfere with DOE work.

[30] Morgan Sparks, in Sandia National Laboratories' FY 1980-1985 Institutional Plan.

exploratory development, final development, development for manufacture, quality assurance, care and feeding of the stockpile, and retirement.

The transfer of contract management for Sandia National Laboratories occurred in 1993. The DOE Martin Marietta Contract states, in part, "The Contractor shall manage operation, protect, sustain and enhance the Laboratory's ability to function as a U.S. Department of Energy Multi-Program Laboratory, while assuring accomplishment of its primary assignment as a nuclear weapons research, development and engineering laboratory."

In 2008, Sandia President Tom Hunter reported: "Our principal mission, as you know, is to provide and support the nonnuclear subsystems for all of the nuclear weapons in the stockpile. We also support a wide range of research and development in other areas of national security." [31]

And Then There Was One—Overall National Security Mission

Today, we hear most frequently that the mission of the labs has changed and is now national security. A belief even exists that Sandia's national security mission is a new mission.

In 1987, Sandia President Irwin Welber described Sandia's mission as national security through ensuring the reliability of the stockpile by monitoring and evaluating weapons as they age.

In 1996, C. Paul Robinson stated that, "We are first and foremost a national security laboratory. All the areas we emphasize are really problems of national security for the nation, regardless of which agency owns them. That is why we exist and where we add value. We've been looking at trying to reintegrate the energy and environment work to make sure it does not become a separate line of business that loses a tie with the national security and the nuclear weapon activities. In particular, we took on a lot of tasks and were awarded major work because we had skills built up in the nuclear weapon program." [32]

Sandia President Paul Hommert affirms: "The mission of this laboratory … is national security," "There's a natural interplay between Sandia's nuclear weapons mission and the broader national security mission that includes defense, nonproliferation, counterterrorism, energy security, and homeland security." [33] "In my view we are a national security laboratory first and foremost that has a unique nuclear weapons responsibility and then has other programs it executes that are part of an overall national security mission. Our weapons work and other national security work should never and cannot be thought of as separate; they have to be managed in an integrated way." [34]

Putting it All Together

Sandia has undertaken three purposeful mission expansions as illustrated in Figure 1. The first change to Sandia's mission occurred in the 1960s, bringing what we now refer to as WFO into the mission

[31] Lab News, "Tom Hunter, NNSA Administrator D'Agostino, other lab directors make case before Congress for FY09 nuclear weapons budget request," *Sandia Lab News,* vol. 60, no. 8, April 25, 2008.
[32] C. Paul Robinson in "State of the Labs: Amid Pressures and Uncertainties, Sandia Still Strong, Creative (but Too Bureaucratic), *Sandia Lab News*, vol. 48, no. 11, May 24, 1996, pg. 5.
[33] Sue Major Holmes, "Labs Director says Sandia strong, playing vital role in nation's security," *Sandia Lab News,* vol. 64, no. 18, September 21, 2012.
[34] Bill Murphy, "Becoming a national security lab," *Sandia Lab News*, vol. 63, no. 17, September 9, 2011.

precept. The second and third expansions occurred in the 1970s. The impact of these significant mission expansion episodes was the promotion of Sandia Laboratories to Sandia National Laboratories in 1979. The encompassing of all Sandia's missions into an overarching national security mission originated in the late 1980s and continues today.

Organizational survival at the conclusion of the Eisenhower Build-up in the early 1960s spurred Sandia to seek reimbursable projects. The ongoing Vietnam War required science and technologies for conventional defenses. By maneuvering into nonnuclear defense work, Sandia survived and did not have to perform staffing reductions.

In the timeframe of the energy crises, Sandia experienced three painful staffing reductions. The addition of energy and environment work to the mission helped Sandia to bolster R&D funding to supplement declining R&D dollars.

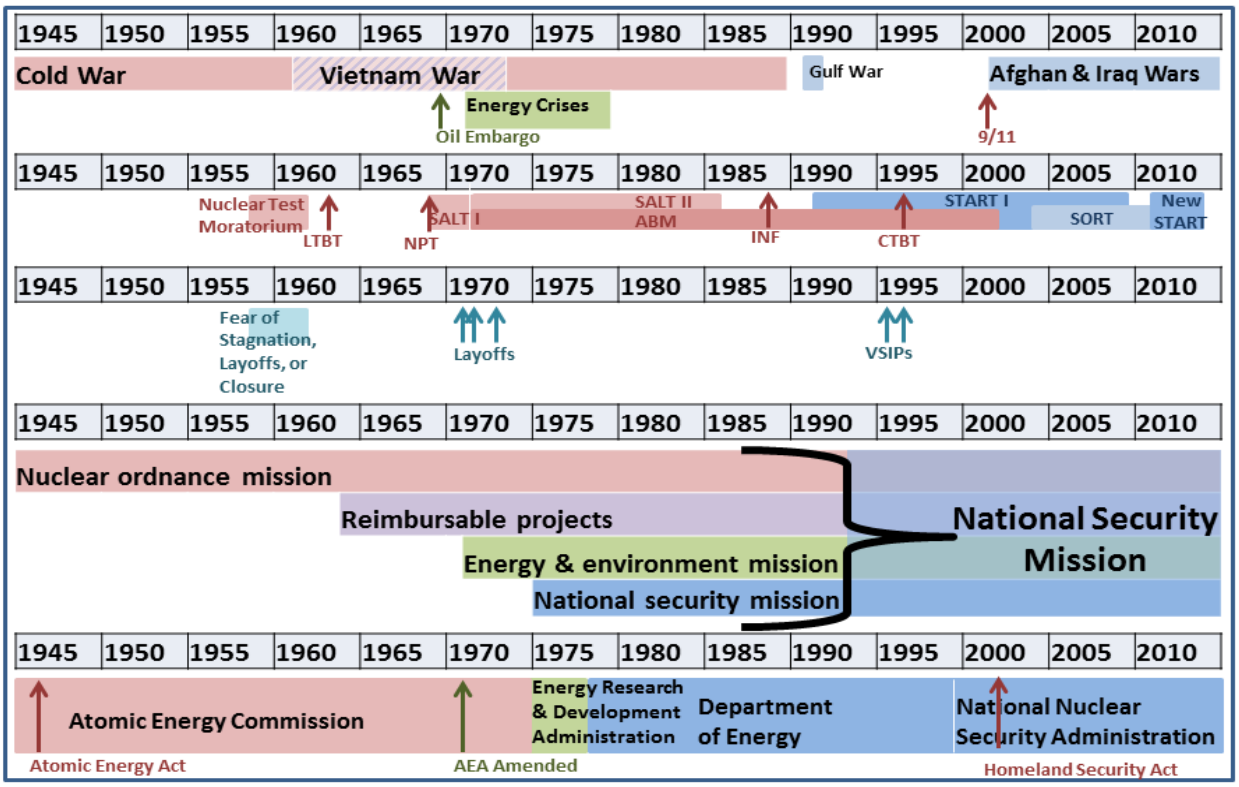

Figure 1. Timelines of World Events, Sandia Missions, and Laboratory Oversight Agencies

The operating cost split between (nuclear) weapons activities (i.e., Defense Programs money from NNSA) and other missions is shown as a percentage of the total in Figure 2. Nearly 100% of the operating costs were weapons activities until 1963 when the first mission expansion occurred. A precipitous decrease in the percentage of weapons activities costs followed until 1971. The decline in reimbursable work in the early 1970s gave weapons activities a greater percentage of the total operating cost of Sandia; but, in 1974 another precipitous decline occurred as ERDA was created and Sandia's mission expanded into energy and subsequently into national security. The weapons activities' share of Sandia's operating costs even dipped below 50% in the years after the end of the Cold War.

In the 1980s, presidential and congressional mandates expanded Sandia's mission to include technology transfer programs that assist strategic industries supplying technology vital to national defense.[35]

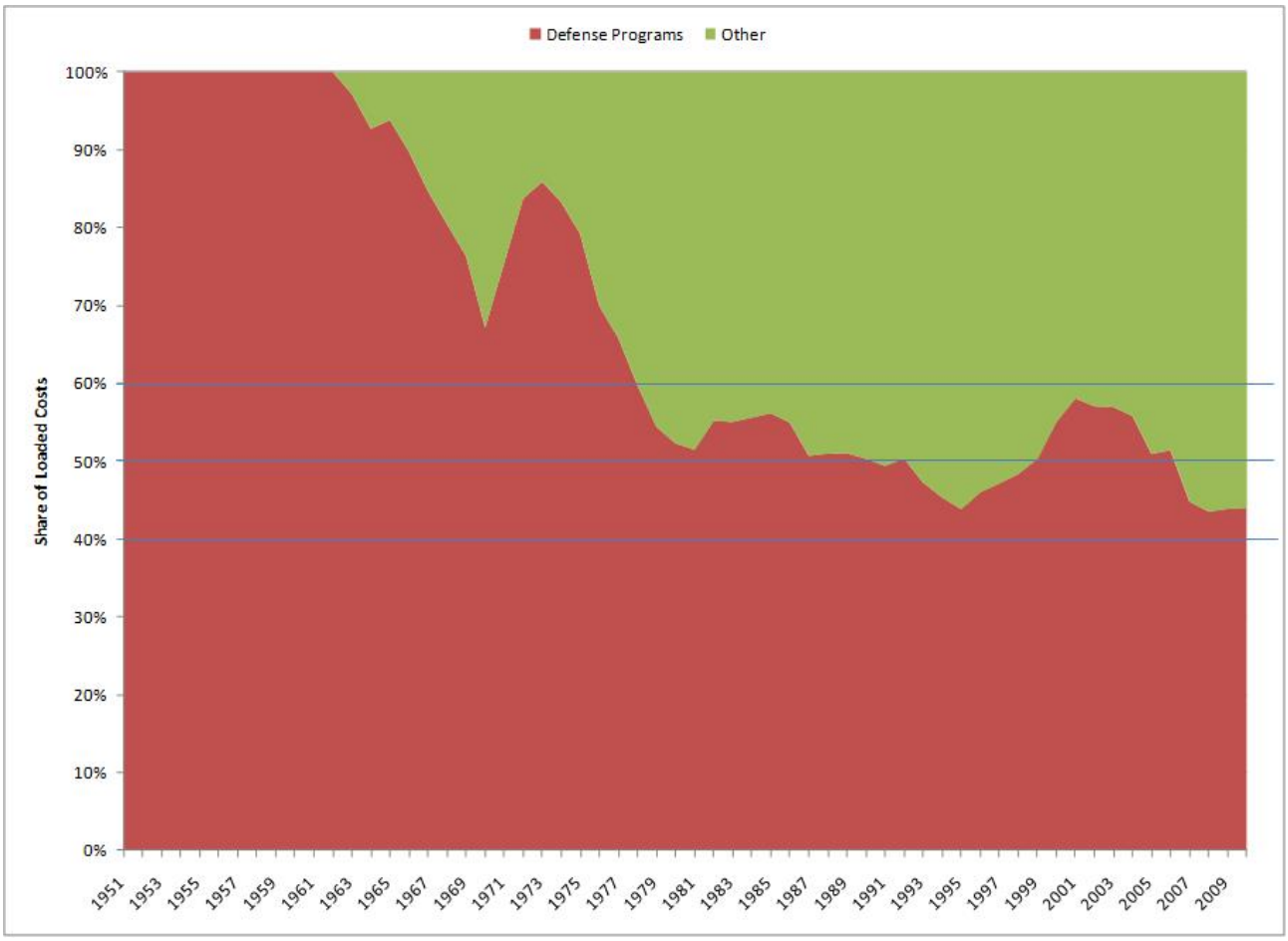

Figure 2. Percentage of Weapons Activities to SNL Total Operating Cost[36]

The non-weapons activities have doubled the operating costs of Sandia—that is, the mission expansions have contributed to a doubling of the work at Sandia. Weapons activities operating costs hover in the vicinity of $1 billion annually; WFO work brings in another $1 billion or so.

[35] An example is passage of the National Competitiveness Technology Transfer Act of 1989.

[36] Warren Drake, SNL draft presentation, July 27, 2011.; data from Waylon Ferguson in Org. 10670, Budget & Program Support, for 1951 through 1996 reproduced the percentages in this graph to help establish the accuracy of the information.

CONCLUSION

Has Sandia's mission changed? Yes. Mission modification has occurred over Sandia's nearly 70 year history; however, Sandia has held to its core mission throughout this duration. Sandia was founded in the wake of World War II to provide NW ordnance. It continued this core mission throughout the Cold War and into present times. In the wake of the Cold War, the "what" of Sandia's mission—to manage the engineering design, production, assembly, and field testing of the non-nuclear components associated with NWs—remained constant; but, how mission work was executed underwent dramatic change.

Why has the mission changed? Sandia has incurred three purposeful mission differentiations leading to the inclusion of defense WFO, energy and environment, and homeland security. Mission modification, evolution, or expansion occurred to help Sandia ensure its future, hedge against painful staff reductions, and respond to national directives.

Does the NW part of the mission seem to be less valued? As an effort to reduce the confusion created by the appearance of having multiple missions, Sandia has rearticulated its mission, defining its overall mission as national security with four components[37] of which the NW component is the core mission. Sandia's core mission area is NW, and ~50% of Sandia's operating costs comes from NW. The overall budget for weapons activities has not declined or been diminished—other mission areas have grown.

[37] The authors note that as this report was being published, Sandia had undergone yet another mission differentiation episode calling out eight mission areas.

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