

**Statement of Ambassador C. Paul Robinson  
President Emeritus and Laboratories Director of Sandia National Laboratories**

**Committee on Armed Services  
of the U.S. House of Representatives,  
the Subcommittee on Strategic Forces**

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**Introduction**

I am C. Paul Robinson from Longmont, Colorado, and I have spent the majority of my career working in various leadership positions within the United States nuclear weapons complex. I was born on Oct. 9, 1941, which as I was to learn only very much later in my life, was coincidentally the same day that President Franklin D. Roosevelt signed the Top Secret memorandum creating the Manhattan Project to build the first nuclear explosive weapons. *Thus, nuclear weapons and I both got our official starts on the same day.* I earned a Bachelors of Science degree and a Ph.D. in Physics and proceeded to the Los Alamos Laboratory, which was the nation's first nuclear weapons laboratory. I spent 18 years there, in a variety of jobs, including the leadership of all of the nuclear weapons programs and national security efforts from 1978 through 1985. After a few years working in the U.S. nuclear industry in New York City, I was appointed to be the Ambassador and Chief Negotiator for the Nuclear Testing Talks between the US and the USSR in Geneva, Switzerland. I was first appointed by President Ronald Reagan and then reappointed by President George H.W. Bush, completing two major treaties and protocols, and several smaller agreements, before leaving the post after the U.S. Senate gave its unanimous approval for ratification of the treaties and protocols in late 1990. I returned to an R&D career, this time at the Sandia National Laboratories, where in 1995 I was appointed to be the President and Laboratories Director. (Sandia itself was originally a part of the Los Alamos Laboratory, but was spun off as a separate entity at the end of World War II.) In 2006, after having served ten years as the leader of Sandia, I retired, but have devoted much of my time since to the same purposes – helping to maintain strong U.S. strategic defense capabilities, and seeking better means to help our nation secure a peaceful and free world. I have attached a one-page vita at the end of this statement, as well as the Disclosure Form for (nongovernmental) Witnesses in order to be responsive to the requirements of House of Representatives Rule XI, clause 2(g)(5), of the Rules of the House of Representatives for the 112<sup>th</sup> Congress.

**Disclaimer:** I am appearing today as a private citizen, and my Statement and oral testimony reflect my own thoughts and experiences. In particular: The views and opinions expressed are solely my own, and do not necessarily state or reflect those of Sandia Corporation, Sandia National Laboratories, the United States government, or any agency thereof.

## **A Brief History of The Weapons Labs and their Federal sponsors**

**Reasons for creating the Go-Co structure:** The first proposal debated within the Manhattan Project (itself placed under the U.S. Army Corps of Engineers) was “Should the country draft all of the scientists we will need into the Army?” This idea was thankfully quite short-lived as a possibility. Also short-lived were any considerations of making the institutions into federal laboratories, largely stemming from the views of many of the scientific leaders of the day, several of who became key advisors to General Leslie R. Groves, who led the Manhattan Project. Their arguments were primarily based on the federal government’s poor prior track record in creating and nurturing scientific institutions. It was believed that entrenched bureaucracies, with their practice of hiring only through the Civil Service processes, were unlikely to move the project forward at the rapid pace needed if its products were to support the war effort.

Then, the idea surfaced of tasking the University of California, an institution that was already providing a number of the key scientists, including Dr. Robert Oppenheimer, to provide leadership and management of the lab. The Go-Co idea was then born — the new entity was to be ***government-owned (and financed), but contractor-operated***. The University of California immediately agreed to take over the responsibility for the personnel functions at Los Alamos, and moved to eventually be responsible for all its management and operations. This arrangement also proved a very useful arrangement for keeping secret the names of the eminent group of scientists and engineers being assembled there. Subsequently, in order to get other major nuclear weapons institutions going, the same Go-Co concept was used to bring in a number of other major companies to organize, manage, and operate other key facilities: e.g. Union Carbide, DuPont, etc. at other Manhattan Project sites.

My own nuclear weapons history dates to December of 1967, when I joined the Los Alamos National Laboratory. As a recent graduate with a Ph.D. in Physics, I was assigned to the Test Division (J-Division) of Los Alamos, and my employer was the University of California. I immediately began to work on experiments carried out at the Nevada Test Site. During my first year I also was enrolled in the classified course in Nuclear Weapons Physics taught by Samuel Glasstone, which became a life-changing experience for me —learning the full extent of the exciting discoveries and inventions that had been achieved during the Manhattan Project. It was also a very humbling experience for me, coming directly on the heels of a graduate specialty in Experimental Nuclear Physics.

The government entity then responsible for Los Alamos was the Atomic Energy Commission (AEC). After World War II and the important role the nuclear devices played in ending it, President Truman had signed a bill on August 1, 1946 creating the AEC, and transferring all nuclear-related research and development work —for both military and peaceful uses— from the War Department (which also then got a new name —the Department of Defense) to the new civilian-run AEC.

In 1974, the Congress created the Energy Research and Development Administration (ERDA), abolishing the AEC and also creating the Nuclear Regulatory Commission. In August of 1977, after less than 3 years of ERDA, President Carter signed a bill which transferred all of ERDA and some other activities into a new Cabinet-level department: the Department of Energy. This step was primarily motivated to try and respond to the “energy crisis” which occurred in the prior two years, initially caused by the Arab Oil Embargo. The nuclear weapons work was quietly “tucked into” the new Department, although most of the new enterprise was to be devoted to its new mission —Energy, writ-large, including in all of its forms.

**Many fundamental problems were experienced both during and after the long transition from the wartime organization to a functioning Department:**

1. When a decision was made to make the Labs permanent after WW II, much discussion centered on the subject of future R&D, and how it was to be used.
2. One stated premise was: “We want the scientists and engineers responsible for U.S. nuclear weapons to always function at “the top of their game”. Therefore they provided a generous portion of the budget for “Weapons Supporting R&D,” which the Lab leaders themselves would decide how best to use it, in order *to best meet that “top of their game” goal.*
3. Before long, a counterpoint of views developed, which suggested that the labs owed “a debt to science itself,” which they should be “paying back”. First at Los Alamos, then later at Lawrence Livermore, large portions of the weapon supporting R&D funds were placed under a separate management than the weapon programs. Soon, other “pure” scientists and specialists in fundamental R&D areas began to be paid for by these funds. *A major inconsistency of course was the result that weapons R&D funds were being used to keep a separate group of scientists at the top of their game, but with few of those being willing to work within the weapons program, or even willing to make themselves available for consultation with members of the weapons program.* A contentious debate ensued. From the late 70s (until the end of 1985) I led all the nuclear weapon programs at Los Alamos, and I can tell you firsthand of my battles against this “pure science tax” on the weapons program. But I achieved little success in reversing that situation. The University Faculty Senate at UC entered its opinions on this issue, arguing that the university really had no business being associated with nuclear weapons or labs for development of such weapons, and they voiced the view that, *unless science was to be generously supported* within the efforts, the university should sever all ties.
4. In response, and in order to continue to support the mission needs of the weapons program for science and technology, we were able to increase the level of a fledging “laboratory-directed R&D effort” or LDRD, and move it up gradually, from 2% to 8% of the total operating budget. But of course, for the past 20 years that effort has been periodically trimmed downward. A separate problem occurred when some labs began to use their LDRD funds to pay for their postdoctoral research fellows. After I had left Los Alamos in 1985, the weapons

supporting research as well as LDRD began to subsidize *foreign postdocs* in growing numbers, rather than requiring a US citizenship, as was usual for most employees. The history of such efforts continues today, but few such postdocs ever gain US citizenship, or more importantly, ever gain security clearances that would allow them to be able to contribute to the US nuclear weapons efforts.

5. After the Nuclear Freeze efforts of the 1970's, and on the heels of the passage of the Non-Proliferation Treaty (NPT), the anti-nuclear lobbying groups began to advocate a policy that became, in retrospect, even more damaging to the exploratory scientific and technical efforts within the laboratories' weapons efforts. These groups suggested their own interpretation of the NPT that would require the US itself to forsake any R&D efforts that might lead to "new nuclear weapons", arguing that if this policy were adopted by the US, more nations might join the NPT regime. Of course, even though such speculations had never been discussed during the treaty preparations, this thesis has continued to be offered to Presidential Administrations and to the Congress over the past three decades. Within the past two years the current US Administration embraced that idea *and issued instructions* prohibiting the laboratories from spending any monies in exploring or creating new nuclear weapons, *unless the work was approved directly, in advance, by the President and the Congress*. This step was taken, even though the formal phased-systems that were adopted for nuclear weapons since the mid-50's [with separate defined phases for concept exploration and development, weapons system development, to actual production and stockpiling of all nuclear bombs or warheads] had always included a specific requirement that to move from weapon system development (phase 3) to actual production (phases 4-6) of any new weapon design **would require explicit approval (in writing) by the President and the Congress**. One can only guess that somehow the current Presidential administration felt that such past prohibitions were also not sufficient in their view, and felt a need to stretch the prohibition further forward in time, in order to try and intercept earlier any "*thinking*" about new nuclear weapons. I believe it is safe to say that within the laboratories today there is a need to clarify whether there should be any attempts to regulate or restrain advanced or exploratory thinking. Research and advanced concept stages are fundamental to the scientific process. Any attempts to regulate "thinking about new weapons," or preventing "new designs", either on paper or in computer models are certainly unwise, and completely contradict the approaches recommended in the famous report "*Science, the Endless Frontier*", which was requested by President Truman to explore the essence of the Manhattan Project and address why its success had exceeded all expectations. That study was led by Dr. Vannevar Bush, and strongly advocated that the government must "constantly open new frontiers in science ... to develop and protect our nation's security in peace time or in war." The present approach to limit exploratory thinking in science is contrary to anything in that report. Such proposals seem more motivated by the calls of a "Nuclear Freeze" in the early and mid-1970's. Doubtless, governments do have the right as well as the responsibility to decide what weapons to build, deploy, and use; but such controls have been in place for U.S. nuclear weapons since their

earliest time. The major debates of the early 1950's in the U.S. on whether to build, test, or deploy thermonuclear weapons (i.e. the so-called "hydrogen bombs") attest to this fact.

Today, there is one other self-imposed constraint, owing to the language within the Comprehensive Test Ban Treaty, which President Clinton signed on September 25, 1996, but for which the U.S. Senate voted to reject its ratification in October of 1999. The U.S. State Department ruling on this matter has had the effect of limiting "new designs that might require additional nuclear underground testing" to be currently prohibited, because such testing would be seen to "act in a manner inconsistent with a (signed but not ratified) agreement". These prohibitions continue to be in place today —16 years after the treaty was signed, but without its entry into force (and with few prospects for its entry into force occurring any time soon). Thus, today, only designs that had been successfully and extensively tested in the past, and which would not require further nuclear testing in the future, are being considered for future U.S. stockpiles.

Let me close this narrow discussion on "new weapons" by mentioning that most other nuclear-armed nations of the world have not adopted any of the prohibitions that the U.S. administration is now requiring of its weapons labs. For others, both in their research and development efforts and in their approach to experimental confirmations in testing, there are no similar constraints. Current restrictions against new nuclear weapons designs reduce the U.S. ability to incorporate results of exploratory science or the application of novel design approaches for developing new weapons. They certainly interfere with the designers' abilities to apply results derived from new scientific and technical breakthroughs or achievements of the times. They further impede progress by restricting the exploration of new ideas and inventions by the US scientists who are charged with the task of attempting to prevent "technological surprises" on the part of other nations — whose scientific research is not subject to such fundamental restraints. By not being able to explore what may be possible, you become "blind" to new possibilities and threats.

More starkly, there is good evidence that some nations are still testing nuclear weapons at low yields. US experts now believe that the levels at which others are conducting underground experiments can allow them to develop completely new primaries for nuclear weapons systems. And, in the case of Russia, their leaders have publically claimed success in fielding of completely new (and revolutionary) nuclear weapons designs via just such a process.

### ***How do we address root causes for the declines in the US nuclear weapons efforts?***

Having watched and worked under the various commissions, agencies, departments, and now an "administration within a department", I have seen a continual degradation in capabilities of the federal entities responsible for managing US nuclear weapons development over the past 45 years, along with parallel declines in the GoCo organizations themselves (the nuclear weapon labs and plants.) Let me cite what I

believe are the primary causes for reduced performances that must be addressed if these trends are to be reversed.

James Conant, one of the principal scientific advisors during the Manhattan projects once was once questioned about “How can America best support the scientists who are working to protect our nation’s security?” He responded, “*The best thing that can be done is to choose men (and women) of brilliance, back them heavily, then leave them alone to do their work.*” Indeed this was, in fact, *an apt description of how the Manhattan Project itself functioned.* But then after the war, when the GoCo model was put forward as Los Alamos was made a permanent institution, the government agencies for their part could scarcely be accused of “having left them alone to do their work.” Quite to the contrary, over a period of many years the *government oversight* over the GoCo’s began to result in direct interference in the processes and procedures used in the laboratories and plants, with the government progressively imposing more and more bureaucratic processes and procedures on the work of the GoCo’s. These have not only steadily increased in the numbers of orders and directives, but in ever more restrictive controls and more strictly defined rules. By the early 1990’s, the notebooks containing the DOE-developed rules and directives overflowed bookshelves that were four feet in width and five shelves in height!

It is not at all unfair for me to state that the burgeoning of a multitude of strict controls within the workplaces of the labs and plants, have caused very serious concerns among the scientific and technical staffs. Yet, I know of no instances where protests by laboratory or GoCo leaders against these restrictive interferences by the government were either withdrawn or made less restrictive. Rather the complaints against these ever-more-bureaucratic obstacles —that were clearly slowing the inherent abilities for the labs (and plants) to do their work— were often greeted with the responses like “we are the customers here; do things the way we want them done.” Yet such behavior flies in the face of the original GoCo approach —that was *originally agreed to be a “partnership arrangement”*. The DOE, within its first few years, similarly changed the operating rules by imposing a schedule of “fees”, usually multiple millions of dollars and up, that were intended to “get the GoCo’s attention”, with awards to be made to those who were most compliant to the voluminous rules being constantly generated. All of the original GoCo’s had agreed to do their leadership and management tasks on a “No Fee” basis, as a service to the nation. Thus they were only reimbursed for costs incurred. Of course, over time, the quest for fees caused an entirely different motivation than national service to dominate GoCo interactions. Over the course of a decade a great many of the GoCo companies and corporations declined to participate further, and today a new cadre of companies, small as well as large, are the parent companies for GoCo’s, with some whose only business today is to operate the labs or plants. For such companies especially, it can be said that the government truly has “captured their attention”, though such fees.

*It became clear to most of us in the labs and plants that the GoCo model had little meaning or value from that point on.*

*Yet, in my view, the primary cause for past (as well as recent) failings of the GoCo model resulted from a basic incompatibility between the “bureaucratic structure and functioning” of Federal government entities, and the basic approaches and operating philosophies needed for successful scientific research and development activities.* Note that these are the very same worries that had been expressed when the GoCo’s were first created —that the government should not be placed directly in charge of these crucial scientific research and development efforts. In half a century, we had come full circle!

We all know too well that bureaucratic ways of approaching work never decrease but only tend to **grow** over time, **unless** there are very strong external forces that can operate to streamline their work procedures. These forces must also be reapplied at frequent intervals, to prevent “regrowth” of the difficulties. Even so, I believe that all bureaucratic structures still will reach a point where they must be **drastically reformed, or eliminated and replaced**, before they become completely dysfunctional. The greatest difficulty lies in realizing and taking the necessary actions in time to prevent further catastrophic failures and damages that would otherwise be certain to occur.

I will shorten the discussion here, but will present in **Appendix 1 of this statement** a more fulsome exposition of **the characteristics and the evolution of such bureaucracies, and their history in slowing down the progress of many government agencies and projects over time.**

Bureaucracies have been recognized since ancient times by a set of characteristic behaviors that arose and were exhibited in larger work organizations. Historically, governments in particular have been more susceptible to degenerating into these adverse behaviors, especially when strong leadership was absent. From Ancient Rome, to the Athenian Greeks, and on to the Ottoman Empire, one can observe that such organizations reached a level of “bureaucratic bloat” that the organizations began to lose their power and efficiency. They required longer and longer times to make decisions, finally seemingly incapable of managing further. A number of distinctive factors and behaviors were noted: impersonal work environments, all actions necessarily inhibited by large numbers of rules and obstructive procedures, internally focused power struggles rather than devoting energies to achieving work outputs, and inattention to actions taking place outside the organization. These too often culminated in an inability of the hierarchical leaders to drive behaviors within the organization, to a final condition where the members were no longer attentive to the very mission for which the organization had been created. Some have described bureaucracies as the ultimate “triumph of form over substance”!

These familiar patterns are widespread across the U.S. government today, but have also made their way into many private organizations, especially larger ones. I find very few who remain optimistic about the future success of the GoCo organizations, which were established to manage the nuclear weapons programs. All of their government sponsors, from the Atomic Energy Commission created after WWII, to the present day Department of Energy (with the National Nuclear Security Administration contained inside of it) experienced a burgeoning of such bureaucratic behaviors. These not only occurred within the government organizations chartered with “oversight” of the programs, but within the

Government-owned, Contractor-operated (Go-Co) entities responsible for directly managing and operating the labs and the production plants. The torrent of directives and order that began to be imposed on them, have finally brought the GoCo system to its current sad state. My conclusion is that *it was the failure by all concerned to control the growth of their bureaucratic behaviors* that resulted in U.S. nuclear weapons organizations performing at a much-reduced level of achievement than was the case when they excelled at what were seen as “history-making” levels of performance.

Throughout that long period, those scholars who researched and analyzed such organizational behaviors were constantly repeating their conclusion —“*bureaucratic organizations are not an effective structure to be used for organized activities or businesses that are required to be innovative*”. This conclusion is especially valid for cutting-edge research and development efforts and for high-tech production. Those of us who have participated in this “60 year experiment” have independently verified that!

The same root causes were cited for the fall of great empires, that *the growth* of their own bureaucracies reached a point where *timely decisions could no longer be made*, even to respond to life-threatening events. And it seems that that this fate can befall any organization over time. While these bureaucratic behaviors do build up within all organizations, large government entities have been found to be especially susceptible. A related contributing factor is cited regarding the structures of modern democratic governments. With a frequent turnover of top personnel through elections, leadership seldom emerges whose knowledge is sufficient to even diagnose, much less to be powerful enough to implement, measures to prevent such destructive growth.

But the question deserves addressing, “Can these difficulties be overcome?” My own readings and experiences over the years on this subject have also convinced me that “**It is not likely, and may be impossible, for bureaucracies to ever reform themselves.**” Rather, oftentimes organizations must either be eliminated or go out of business, or be completely rebuilt in order to achieve real changes in bureaucratic behaviors or reductions in their costs. We are also all familiar with the phenomenon in which private companies, who fall victim to their own increasing bureaucracy, soon lose their market to “start-up” companies. These new entities are generally much more aware of, and more responsive to, the conditions in the external world, as well as having an edge as a result of their timeliness and efficiency in accomplishing their tasks. The **new** inevitably outperform the **old**.

*Based on the above discussion, let me conclude that “I believe the existing Go-Co concept, which was originally created to run the nuclear weapons laboratories, has finally run its course, and now requires drastic reforms!”*

At one point, I had gained enthusiasm when the *Quality* and *Lean* methodologies came into wider use within U.S. companies and institutions, especially with the quality maxim of *continuous improvement*. I could immediately see that principle as just a restatement of *the scientific method* itself. In both scientific processes and in quality processes — as a result of observations, experiments, and understandings— superior products and

performances can be achieved. We in the Labs started our “quality journeys” and urged the DOE and NNSA to embrace those disciplines. In truth, the leaders of those organizations did embrace these ideas, and for a while, things did appear to be improving. That was until a point was reached in which workers in their organizations began to believe that fewer of them would be needed as a result of the efficiencies and superior operations that were being achieved. Unfortunately the “leaning out” of work processes, along with quality improvements, *ceased* when the Federal employees perceived that their jobs might be threatened by their own actions. Yet, the quality approach dictates that only the employees doing the work have the ability to drive the needed improvements, as it is not possible to make these improvements only by “inspecting out the defects”. Unfortunately, the present state where quality and lean thinking are now in disuse, might well have been prevented if the very real concerns of these employees had been better handled. Without a vision or plans for the future roles for these government workers having been created, lean-thinking and quality-driven improvements soon ended.

Looking back at the several decades of my career spent in trying to save and restore the Go-Co model, sadly, I am convinced that all of the successive levels of bureaucracy that have grown up after the Manhattan Project have now made it nearly impossible to have optimism for the future for anyone engaged in any part of the programs –within government or within the GoCo’s. The multiple steps and difficulties that must be overcome to *accomplish even simple tasks within technical programs or projects have reached the point that they have become “unworkable”* for the scientists and engineers still dedicating their lives to the nuclear weapons missions.

With these levels of obstructions to accomplishing work that are in place today, the success of the laboratories themselves (which were never immune to the growth in their own internal bureaucracies) is threatened. The individual performances and the major collective accomplishments needed to fulfill their important national security missions seem destined to fall short of the nation’s needs, unless there are major commitments to change paths, and follow-through to achieve the needed reforms.

***Therefore, based on the prior discussions, let me summarize the overall conclusions I have reached: The GoCo concept —created in the hope that the nuclear weapons laboratories and plants would continue to be the highest performing of scientific and technical institutions— has now failed. It must be extensively reformed.***

Regarding what to do, I kept asking myself, “Why is it, in the those years in which these organizations existed as GoCo’s under the U.S. Army Corps of Engineers, their successes were so extraordinary and history making, but they have now degenerated so badly? The answer as to what might be done to fix the current situation almost suggests itself :

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***“Why not try going back to the much simpler organizational approach that functioned so well during the Manhattan Project?”***

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***Therefore, being as succinct as I can be, the essential elements for change that I would recommend to you are:***

***I believe it is essential to now: (1) eliminate the NNSA and all of its responsibilities within the DOE, (2) remove all remaining nuclear weapons responsibilities from the Department of Energy, and (3) stand up a new, leaner organization within the Department of Defense, using some of the existing parts of the current NNSA.***

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This recommendation is surprisingly similar to the recommendations of the Defense Science Board Task Force on Nuclear Capabilities (Report date: December of 2006), which was co-chaired by General Larry Welch and Dr. Johnny Foster. I was a member/advisor within the Task Force. As a result of their experience, in perhaps being seen as too prescriptive in their proposed changes, I have not taken on the issues regarding what the appropriate titles should be for those who would function within the Office of the Secretary of Defense (OSD) hierarchy, believing that it would be best left for the Department of Defense (DoD) itself to address and decide those questions.

Let me point out however, that I recently was one of the five members of the board who carried out the Comprehensive Review of U.S. Nuclear (Weapons) Command and Control Systems (NCCS) for the Secretary of Defense. I came away believing the diagnosis we made of those NCCS problems, and the suggestions we made to correct its difficulties, are remarkably similar to the diagnosis and cures that should now be applied to the nuclear weapons R&D and production communities. There, we saw a dysfunctional separation as the primary root cause for its current problems. These had been growing in between the many largely-independent government agencies who now “must share the responsibilities” for the operation and security of the NWCC systems, with their all important requirements to ensure their continued reliability. But, in truth, we also saw the damages that had resulted from the growth of bureaucracy within in those organizations. For the nuclear weapons communities, the long separation of the Nuclear Weapons RD&D activities from the Department of Defense, and especially the separation of the labs and plants from the uniformed military services, which has gone on far too long, has been detrimental to communications, cooperation, and joint planning. The new structural arrangements being proposed here could rectify these problems, as the U.S. (Strategic) Navy and the U.S. (Strategic) Air Force commands and staffs are drawn into closer partnerships with the R&D and Production efforts. For example, for the first twenty years of the labs, there were large numbers of uniformed military routinely assigned as on-site research associates at all three nuclear weapons labs. Their intensive interactions set the stage for their later successful careers, based on the fundamentals they learned and the shoulder-to-shoulder interactions with personnel who were responsible for all parts of nuclear weapons. These often proved essential for cementing an attitude of close cooperation, which endured as these individuals rose to become commanders and general officers within the uniformed military. Such interactions and benefits hardly exist today, primarily because of the increasing separation of their parent organizations. The organizational reforms proposed here would directly address and correct that.

It is my belief that a trimmer, more responsive core organization can be formed from the *existing NNSA*. *It should be moved to the Department of Defense, but only after a vigorous streamlining* of the duties, organizations, and communications paths, so essential for ensuring that the Federal roles are better defined, without either the duplications or built-in conflicts which exist today. The GoCo structures should begin anew from that point, operating much as they are today, but with the acknowledgement that the DoD will decide the next step in selection of the GoCo contractors charged with *leading* and operating the nuclear weapons laboratories and productions plants and sites in the future.

I believe that the newly recreated and reformed NNSA-like organization within the Department of Defense should have *a stand-alone, independent existence*, similar to the DARPA structure in that sense. For example, I would expect that its budget would continue to be planned and responsibly managed from within that new organization, rather than flowing from the unformed military controllers. The procedures already extant within the management of the **050 account within the military spending accounts** already incorporates this approach to NNSA funding. The new integrated organizational planning would provide the opportunity to do a better job in harmonizing the development, production, delivery, and dismantlement schedules for nuclear weapons between the services and the new organization. They should all focus on improved co-ordinations of their programs to achieve a closer integration of their missions.

Recent actions taken as a result of the need to provide a clearer path for uniting responsibilities and authorities for the U.S Nuclear (Weapons) Command and Control Systems (NCCS.) These have resulted in the authorities and responsibilities being placed *within the direct reporting line of the Deputy Secretary of Defense*, acting with a day-to-day responsibility on behalf of the Secretary of Defense—in his designated role as the Executive Agent for NWCC for the President. Thus, it would seem appropriate that the nuclear weapons research, development, and production might take a parallel route to obtain maximum synergy and ease of communications, but that should be left for the Defense Department to decide how best to organize itself.

Let me also cite here the additional responsibilities that in recent years have been given to the nuclear weapons labs, beginning with Sandia Labs, but which are now expanding to Los Alamos and Livermore, to function more fully as “national security laboratories”. All the labs anticipate wider programs and responsibilities for advanced technology capabilities within the conventional and special forces defense communities. These also include support for Defense Intelligence technologies and systems, and with wider responsibilities for helping to counter terrorism for both Defense and Homeland Security departments. These expanded national security initiatives would be significantly strengthened by the changes proposed here.

I am intentionally refraining from further speculation about how to create the new government agencies, knowing that it would be easy to go too far in trying to tie down details that need the benefit of wider participants in the creation of these recommendations prior to these being implemented. Let me just say that the major

changes truly can be justified. It is time to “**bring these programs back home**” to the agency that originated the mission and which was so effective in achieving its initial goals during the Manhattan Project.

It should also be noted that after World War II, some began to see the importance of nuclear weapons as being so large (in the aftermaths of Hiroshima and Nagasaki) that they believed these matters should only be managed by a “civilian leadership” and not simply placed in the hands of the uniformed military. Whether those viewpoints were real or only theoretical is a moot point. Today they are no longer an issue, as the Defense Department is, and has been for the past 60 years, a civilian-managed agency. To further insure the purpose of that decision continuing, there are already formal prohibitions in place that prohibit any general officer becoming the Secretary of Defense. Finally, I should note that these proposals for change would also formalize what has arisen and is already in place — the missions and goals that we in the nuclear weapons complex embrace are closely aligned with those of the Department of Defense — to preserve peace and security, by all available means.

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There are three more related subjects I want to briefly mention, although **these are of lesser importance than the previous discussions**. Their consideration, however can prove useful in giving the best chance for creating a highly effective “new NNSA”, including improving the performance of the nuclear weapons complex as a whole, including the weapon production plants. But, because my knowledge of the production plants is not as current as it was in the years when I had frequent first-hand visits and contacts, I will not attempt here to recommend specific reporting paths for the weapons production plants. Others should be consulted in these questions, although it is my belief that **the plants would move to the DoD along with the labs**, as their continued close working partnerships are an essential success factor for being able to field U.S. deterrent forces.)

Next, let me point out that there is a fundamental theorem of Systems Analysis which is widely known within technical communities and which is quite apropos if one is to be able to successfully reengineer the government agency responsible for the labs and the plants: namely, **One can not optimize a system only through efforts to optimize the component subsystems**. Yet, this is just what has been attempted many times over the history of the nuclear weapon complex —from at least the mid 60s all the way through the current times.

One clear example you ought to become familiar with is the decision which was made when the NNSA legislation was first passed (and which I believe was a glaring violation of the specific wording of the legislation), namely, responsibility for the subcomponents of Safety and of Security were not placed under the new NNSA management, but were retained in a stove-piped manner (through “double-hatting”) within their pre-existing DOE organizations. These actions are also **clear examples where key responsibilities and authorities were separated** (where they should have been unified.) Yet these extremely important functions require a necessary and close inter-relationship to be

successful in accomplishing the overall weapons mission, and to prevent the costs thereof from burgeoning for these tasks. The result was that Safety issues and Security issues ended up functioning completely independently of the planning, management, or execution of the weapons programs.

Any basic management textbook will tell you how wrong that choice was. I have testified to this committee in the past about the effects these specific problems have created, including how they have greatly escalated the costs for nuclear weapons construction work, including the very important, but contested, CMRR at Los Alamos. This facility is so greatly affected because the CMRR work of creating plutonium pits for weapons requires both the highest levels of safety against hazards, as well as a need for the highest levels of security. Yet, today, these DOE highly bureaucratic safety and security organizations still continue to dictate to the weapons complex and to NNSA exactly what they want carried out in order to optimize safety and security, but without any other considerations. Certainly their actions do not give consideration or deference to the importance of the success of the nuclear weapons mission. They have particularly failed to take into account the effect of their directives on the conduct of actual nuclear weapon work, or new bureaucratic constraints created, or the resultant overall costs escalations. The net effects on progress within the plants and labs have never been simply awful. That these inadvisable actions were taken even though the NNSA labs and plants had already achieved, and have maintained safety incident rankings that exceed by far the OSHA nationwide standards for similar work and organizations. *Efforts to rectify these past errors in decision-making should be fundamental to the re-creation of the GoCo structures of the labs and plants under a new DoD parent organization.*

Let me not fail to mention here an equally egregious but completely parallel action that was taken when *the Defense Nuclear Facilities Safety Board* was created, which predates the formation of the NNSA. Not only did the creation of the DNFSB organization separate responsibility and authority, but also made it nearly impossible to resolve any of the differences that inevitably appeared when the Board has acted completely autonomously from the weapons program leaderships at the labs, plants, or the NNSA itself. When strong differences in views have arisen between the Defense Board and any of the program entities, it has required the escalation of the issues all the way to the Secretary of Energy and his personal involvement in order to adjudicate the differences. Thus few issues were actually decisively settled. A “Quality” solution would have placed the two such organizations in a reporting role to the same boss, just as—for example—the highest-ranking inspector of nuclear power plants reports to the same boss as the highest ranking official responsible for operating the plant. That “boss” should likely be the head of the “new NNSA”, whatever final title is selected for that individual. That way the intentionally “split” responsibility and authority can merge together at that official, with the independent oversight official and the program leader on equal footings. To date, resolution is more rare than not in the overall DNFSB record. In my view, the effects of their efforts are to inevitably stretch out the time and escalate the costs for maintaining, modifying, or constructing facilities, but without achieving much in the way of appreciable or intended benefits flowing from the efforts that were extended. *As you in the Congress seek to find answers to help fix the manifold problems of the labs,*

*plants, and NNSA, I urge you to put the issue of whether to continue the DNFSB, and its present reporting structure, high on your list of problem areas that need to be addressed.*

In closing, let me urge you once more, that all deliberate speed is necessary. The numerous bureaucratic barriers that that were constructed at the Federal level were built up over the full history of the management of U.S. nuclear weapons –i.e. over 60 years or more— without having identified them as the most serious root cause of difficulties, and with insufficient attention ever being devoted to them. Besides urging you today, that only a major reform effort has a chance of succeeding, I also urge you not to fall into the trap of ever retreating to select only small changes or actions to treat these quite serious problems. ***I believe attention to these core problems has been postponed for so long that you must now be bold.*** Besides boldness, you must also be very attentive to thoroughly identify any likely “unintended consequences” that can inevitably occur as specific changes are made, and try and correct them early in the process. As always, and particularly for parts of the bureaucracy that have been in place for such a very long time, resistance to these, or any, changes will likely be severe.

I hope I can add clarity to anything that may now be confusing, as we proceed to the Q and A period. I thank you for your attention.

## Appendix 1

### *A discussion of the Background, History, and Characteristics of Bureaucracies*

[The background of how bureaucracies are formed and grow has been extensively analyzed in some detail in the literature within the fields of history, sociology, and economics. In Michel Crozier's 1964 book *The Bureaucratic Phenomenon* was singularly successful in describing the evolution of destructive bureaucracy within organizations that attempted to so systematically design their work processes to a degree that all outcomes would be "well-defined" in advance. The workers in such organizations—in order to gain some measure of "respectable" control over their lives—soon begin to focus on exploiting any "zones of uncertainty" they can identify within those work processes. He characterizes *the struggles that result* within these organizations *quickly degenerating into mere "strategic games"* to try and exploit such uncertainties for their own ends, or to try and prevent others from gaining an advantage. The work environment then becomes *focused only on internal (and inward-looking) power struggles*, which he calls "vicious circles". Soon, the *senior levels* of the hierarchy *lose the power to govern*, and the wider *goals of the organization are also forgotten*.

The result of such activity then proceeds to grow, aided especially due to the impersonal nature that exists within the larger bureaucracies. With the decision-making hierarchy having broken down, it reaches a point where any decisions that must be made will take longer and longer to be accomplished. If issues are ever resolved, it is more likely that those individuals who have gained control over the "zones of uncertainty" can wield disproportionate power to their previous role in the hierarchy, and those who end up actually forcing a decision are those who have no direct, or in-depth knowledge of the issues involved. He particularly notes that the most tangible *final work product* that appears as a result of these machinations *become a set of impersonal rules which are said to cover every event*. Crozier also observes that after many years of such situations operating, inevitable parallel power structures emerge, further exacerbating the possibility that decisions can ever be made that are based on factors that are important to the organization as a whole, **or to the mission for which it was created**. One universal conclusion widely expressed in such studies is that *"bureaucratic organizations are certainly not effective for organizations whose purpose is to innovate."*

The growth of bureaucracy within governments has been credited as the principal cause for the failure of many of the major Empires of history. Many historians have attributed the fall of the Athenian Greek Empire as well as its successor, the Roman Empire, to the uncontrolled growth of their bureaucracies, to the point that they could no longer function to cohesively manage or govern. Similarly, the fall of the Ottoman Empire, which thrived from 1300 to 1900, is also thought to have been a direct result of its enormous bureaucracies, and the vast power to which they held sway. The Ottoman government structures initially grew up over that period in order *to govern the Empire*—in place of weak Sultans, who had quickly proved overwhelmed by the task. But history records that these bureaucracies, who initially were perhaps the greatest examples of bureaucratic

organizations which functioned very well, then grew so unwieldy that they suffered the classic fate that befalls most bureaucracies: (1) they grew *too large to effectively communicate or cooperate*, and (2) they became so *internally focused* that they were unaware of the realities of the worlds outside their own territories and the changes taking place there, and (3) they became so *slow in their decision-making* processes that even the crucial decisions that might have saved their Empire could not be either made or acted upon.

I think it is likely that all of us have knowledge through our personal experience of the difficulties inherent in the operation of bureaucracies and in their natural tendencies to grow. My own career included several assignments where I unfortunately got to see what in my experience might even deserve to be nominated as the worst examples of bureaucratic organizations of our modern times. The first was the US “Space Nuclear Propulsion Office”. In the 1960’s the US government had stood up a large effort whose goal was to develop nuclear-powered rockets to be used for missions to and from the Moon and Mars, and even for space tug duties in orbit around the earth. Although originally created within the Atomic Energy Commission, when it rose to a level that it began to appear feasible that the technology could be key to new space missions, the National Aeronautics and Space Administration (already a large organization well on its way in bureaucratic evolution) argued to the US Congress that they should be given responsibility for the program. A decision was made that a joint organization —the Space Nuclear Propulsion Office— staffed by an initial mixture of NASA and AEC employees— be created, and it began a separate bureaucratic evolution path. By the time that I was assigned in 1969 to be the Chief Test Operator for Los Alamos ground tests of nuclear reactor rockets in Nevada, although the technological performance was becoming quite impressive, it was apparent to most that the program would likely die of its own weight because of the extremes that had been reached in bureaucratic behaviors within the SNPO. And indeed when that soon happened, most involved thought its demise was a blessing in disguise.

Later, in 1987, when I was appointed by President Reagan to be the Ambassador and Chief Negotiator for the Nuclear Testing Talks in Geneva, Switzerland, I and my direct staff were assigned within the U.S. State Department. During the initial preparations, and during other periods such as recesses, Presidential transition, and for the ratification efforts, we actually resided within the State Department headquarters in DC. The State Department had been created in 1789 —the very first Federal Department ever established by the US government. As we got to observe on a close-up basis, it was all too apparent to me and members of my delegation, that just as one might have expected, this oldest standing Department of the U.S. government, had “excelled” in raising the evolution of bureaucratic behaviors to uncontested highs (and of course with corresponding new lows in efficiency and effectiveness). It was nearly impossible to get even routine work needs performed, and the level of energy put into meaningless internal struggles was incredible. My judgment was that, had there not been a separate staff of “Foreign Service Officers” who worked quite long hours to persevere in spite of the bureaucracy all around them, the department would have failed long ago.



## **Ambassador C. Paul Robinson**

**President Emeritus and former Laboratories Director,  
Sandia National Laboratories  
& US Ambassador and former Chief Negotiator,  
Nuclear Testing Talks**

From October 1990 to January 2006, C. Paul Robinson served in various leadership posts at the Sandia National Laboratories, a Lockheed Martin Company, becoming its Laboratories Director in 1995, and President of Sandia Corporation. During the 10 years he led Sandia, he focused on the laboratories' national security missions, increasing its efforts in nuclear weapons design and development, in non-proliferation and material controls around the world, and led new initiatives in counterterrorism, homeland security, and broadened the lab's support for the Defense Department and the intelligence communities. He also pioneered broad and innovative strategies for partnering with universities and industry and led a major revitalization of research and development efforts, with construction of new laboratory buildings and experimental facilities. In April 2005 Robinson stepped down as President to support Lockheed Martin Corporation for a special project. He retired from LMC and Sandia on January 31, 2006.

Robinson is a member of the Strategic Advisory Group for the Commander, US Strategic Command, where he chaired the Policy Panel from 1992 to 2005. He also serves on the National Nuclear Security Site Advisory Panel. He recently served on the US Nuclear Command and Control System Comprehensive Review for Secretary of Defense Robert Gates. He previously served on the US State Department Advisory Board on International Security and Arms Control for Secretary of State Condoleezza Rice, and on the NASA Advisory Council for Director Michael Griffin. He served as the Chairman of the US Presidential Technical Advisory Group on Verification of Warhead Dismantlement and Special Nuclear Materials Controls, and on the Scientific Advisory Group on Effects for the Defense Nuclear Agency, and on the Defense Threat Reduction Advisory Committee. He now serves on Defense Science Board studies and has served on several other Boards, provides advice to many other government agencies, and frequently testifies before the US Congress.

Appointed by President Ronald Reagan, confirmed by the US Senate, and reappointed by President George H.W. Bush; Ambassador Robinson served as Chief Negotiator and Head of the US Delegation to the US/USSR Nuclear Testing Talks in Geneva from 1988-90. These negotiations produced Protocols to the "Threshold Test Ban Treaty" and the "Peaceful Nuclear Explosions Treaty." Both, along with the treaties, were ratified unanimously by the US Senate in 1990 and are in force between the US and the Commonwealth of Independent States. The Joint Verification Experiment, which he and his delegation negotiated, was carried out in 1988. It laid the foundations for what have become extensive US and Russian Lab-to-Lab efforts.

From 1985-88, Robinson was Senior Vice President, Principal Scientist, and a Board Member of Ebasco Services, Inc., a major New York-based engineering and construction firm. He spent much of his early career (1967-85) at the Los Alamos National Laboratory serving in the Nuclear Test Division, the Advanced Concepts Group, and leading the Laser Spectroscopy and Isotope Separation Division (AP), and the nuclear weapons and other defense and national security programs as Principal Associate Director of the Laboratory.

Dr. Robinson was elected to the National Academy of Engineering in 1998 and serves in various Academy posts. He also has received: the Outstanding Public Service Medal from the Joint Chiefs of Staff for *contributions to strategic forces*, NASA's Exceptional Public Service Medal for *his contributions to Space Operations*, the Smyth Nuclear Statesman Award from the American Nuclear Society for *40 years of contributions to national nuclear efforts*, the American Physical Society's Pake Prize for *outstanding leadership and research accomplishments*, the Secretary's Gold Award from the Department of Energy, and a Distinguished Citizen Award from the New Mexico Governor.

Dr. Robinson earned a B.S. in Physics from Christian Brothers College and a Ph.D. in Physics from Florida State University, and also received an honorary doctorate from Christian Brothers University.

*Revised Jan. 2011*



**FISCAL YEAR 2009**

Federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant

**Federal Contract Information:** If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2011): 1 fee contract, 3 no-fee contracts \_\_\_\_\_ ;  
 Fiscal year 2010: 1 fee contract, 4 no fee contracts \_\_\_\_\_ ;  
 Fiscal year 2009: 1 fee contract, 3 no fee contracts \_\_\_\_\_ .

Federal agencies with which federal contracts are held:

Current fiscal year (2011): DOE(1 fee contract),STRATCOM,DSB, DOE-SNL: all no fee ;  
 Fiscal year 2010: DOE(1 fee contract),DoD, STRATCOM,DSB,DOE-SNL: all no-fee ;  
 Fiscal year 2009: DOE(1 fee contract),DoD, STRATCOM,DOE-SNL: all no-fee \_\_\_\_\_ .

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2011): NV test site bd,SAG, DSB Task Force, Sandia Emeritus ;  
 Fiscal year 2010: NV test site bd, NWCC FACA,SAG, DSB Task Force, Sandia Emeritus ;  
 Fiscal year 2009: NV test site bd, NWCC FACA, SAG, Sandia Emeritus \_\_\_\_\_ .

Aggregate dollar value of federal contracts held:

Current fiscal year (2011): 2,930,400 (my aggregate fees \$5,250) \_\_\_\_\_ ;  
 Fiscal year 2010: 2,999,300 (my aggregate fees \$4,500) \_\_\_\_\_ ;  
 Fiscal year 2009: 2,960,100 (my aggregate fees \$6,416) \_\_\_\_\_ .

**Federal Grant Information:** If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2011): none ;  
Fiscal year 2010: none ;  
Fiscal year 2009: none .

Federal agencies with which federal grants are held:

Current fiscal year (2011): \_\_\_\_\_ ;  
Fiscal year 2010: \_\_\_\_\_ ;  
Fiscal year 2009: \_\_\_\_\_ .

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2011): \_\_\_\_\_ ;  
Fiscal year 2010: \_\_\_\_\_ ;  
Fiscal year 2009: \_\_\_\_\_ .

Aggregate dollar value of federal grants held:

Current fiscal year (2011): \_\_\_\_\_ ;  
Fiscal year 2010: \_\_\_\_\_ ;  
Fiscal year 2009: \_\_\_\_\_ .