

## Why Transforming the DOE Nuclear Weapons Complex Is So Difficult (Part II)

Mark Bodnarczuk  
Executive Director  
Breckenridge Institute

[www.breckenridgeinstitute.com](http://www.breckenridgeinstitute.com)

This is the second in a series of articles that describes why transforming the Department of Energy (DOE) Nuclear Weapons Complex is so difficult based on the findings and recommendations in the National Research Council's (NRC) February 2012 report on *Managing for High-Quality Science and Engineering at the NNSA National Security Laboratories*.<sup>1</sup> The NRC Report *confirms* the findings and recommendations of previous studies and reports, and raises our *awareness* of the underlying "broken" and "dysfunctional" relationship between National Nuclear Security Administration (NNSA) and its management and operating (M&O) contractors – a relationship that emerges from a culture of mistrust in both the Federal and M&O contractor organizations. This second article continues to argue that NNSA and its M&O contractors need to broaden their vision of transforming the Nuclear Weapons Complex to include organizational transformation, not just site closures, consolidating foot prints, and consolidating M&O contracts. It claims that the NRC Report's recommendations and the proposed legislation in the FY 2013 Defense Authorization Act (including shifting large construction projects to the Department of Defense) will not create enough positive change to seriously reduce excessive formality of operations or to rebuild the level of trust in the NNSA M&O contractor relationship unless they directly address the three interdependent *Common Causes* described below.<sup>2</sup> It intentionally focuses on the NNSA organization rather than M&O contractors because the configuration of structures, systems, and resources within NNSA powerful shapes and defines the socio-cultural context within which M&O contractors must operate. So while these three Common Causes are also woven into the cultures of M&O contractors, the best way to ensure that the Nuclear Weapons Complex is transformed is to *begin* by transforming NNSA, and then reflecting these changes in M&O contracts and award-fee-based performance objectives.

### ***Common Cause #1: The Gap between the Formal and Informal Rules***

There is a *gap* between the formal (written) rules for how things get done in NNSA, and the informal (unwritten) rules for how things "really" get done.<sup>3</sup> Fear of retribution among NNSA managers and staff members makes the gap between the formal and informal rules undiscussible, so the essential tension between NNSA HQ mission-program and NNSA SO oversight personnel creates the perception that "as a whole" NNSA does not *speak with one voice*. This perception has become "reality" for M&O contractors and seriously undermines trust within the NNSA/M&O contractor relationship. The Design Principle for addressing this Common Cause is for NNSA to acknowledge and narrow the gap between the formal (written) and informal (unwritten) rules for how things are done, and to take the concrete action required to narrow (or eliminate) this gap.

The NNSA was created in 2000, and as early as 2002, the Foster Panel Report stated that there was a "...disturbing gap between the nation's policy that maintaining a safe and reliable nuclear stockpile is a supreme national interest, and the actions taken to support this policy. Congress created the NNSA to address this situation and other longstanding problems. Although progress has been made, much more needs to be done."<sup>4</sup> The NRC Report states, "The study committee observed widespread perception among Laboratory S&E staff and some managers that NNSA oversight activities were inconsistent with statements by NNSA that oversight is accomplished without being intrusive; i.e., 'eyes on, hands off'."<sup>5</sup> There is a "gap" between the formal policies and statements by NNSA that oversight should be accomplished without being intrusive (eyes on, hands off; manage the contract,

not the contractor), and the way oversight is actually conducted by NNSA in day-to-day operations. In Part I, we suggested that one of the causes of this gap is that the perspectives, interests, and concerns of NNSA HQ mission-program personnel and NNSA Site Office oversight personnel are different than (and in some cases opposed to) each other because the primary focus of their time and energy is on getting the results they're being held directly accountable for – *either* mission-program goals, *or* oversight goals, rather than what Jim Collins calls both-and-thinking.<sup>6</sup> The perspectives, interests, and concerns of NNSA HQ mission-program personnel and M&O contractors tend to be more aligned than those with NNSA Site Offices because they're focused primarily on S&E and mission, which creates a “triangulation” that prevents these three organizations (NNSA HQ, Site Offices, and M&O contractors) from working together as an effective “team” who shares a common fate where one cannot succeed without the other.

More specifically, most NNSA HQ and Site Office personnel clearly understand the formal (written) rules of “giving direction” in terms of the Site Office Contracting Officer (CO) and the Contracting Officer Representative (COR) being the only people who are authorized to give direction to M&O contractors. The COR provides mission-program related direction, and the Site Office and CO provide “boots on the ground” day-to-day oversight to ensure that M&O contractors are meeting their contractual/legal obligations. Direction must go through the formal channels of the COR or Site Office CO or it is not legally binding on M&O contractors. In fact, Federal employees who are not authorized to give direction and do so with the result of negatively impacting the cost and performance of a Lab or project can be held legally accountable for those costs as defined in DEAR 901.602-3 (Ratification of Unauthorized Commitments). Most NNSA HQ and Site Office personnel also clearly understand (and can explain) the distinction between it being NNSA's responsibility to provide a clear definition of “what” needs to be done, and the M&O contractor being responsible for determining “how” that work should be done. This point is made over and over again in the NRC Report, especially in recommendations 4-1, 4-2, 4-3, and 4-4 concerning the rebalancing of the NNSA/M&O relationship in terms of governance and moving from transaction-based to performance-based oversight.<sup>7</sup>

But there is a *gap* between the formal (written) rules that only the COR and Site Office CO can legally give direction, and the informal (unwritten) rules for how direction is actually given. With large scopes of work (like managing and operating a Lab or overseeing a large construction project) the tendency is for NNSA Site Office personnel to become more involved in the details of *how* work is accomplished, rather than focusing only on *what* gets done because of the day-to-day realities of Feds and contractors working together in close proximity. Federal and M&O contractor personnel jointly review documents, participate in assessments, and attend decision-making and status meetings, so it's difficult for Federal personnel *not* to give direction, or for M&O contractors not to “hear” input and discussion by Federal employees as “being” direction. If an NNSA Site Office person identifies an operational issue and raises it in a meeting or an e-mail, the question is, How far does the definition of “oversight” entitle them to push that issue before they begin “managing the contractor, rather than the contract”? At a very practical and concrete level, the roles of NNSA Site Office oversight of work that contractors have been paid to do is not clearly defined, and the more technical the NNSA employee is (either in HQ or a Site Office), the more difficult it is for them to avoid being drawn into the details of actually *doing* the work, rather than *overseeing* it. Recommendations 4-1, 4-2, 4-3, and 4-4 from the NRC Report call for a clarifying of this boundary and more clearly defining roles and responsibilities for Feds and contractors, but *formally* canonizing this in an Memorandum of Understanding (MOU) is unlikely to narrow the “gap” and change the long-standing informal (unwritten) rules for how oversight is “really” done.

As mentioned previously, fear of retribution among NNSA managers makes the gap between the formal and informal rules undiscussible and creates the perception that “as a whole” NNSA does not *speak with one voice*. For example, if an NNSA manager from a Site Office does a six month

detail in NNSA HQ and actually participates in oversight activities that exemplify the “eyes on, hands off” and “manage the contract, not the contractor” approach they are more likely to begin to see the value in this perspective. They are also more likely to begin to see the gap between the formal and informal rule more clearly when they return to their position in the NNSA Site Office. If this manager openly discusses the gap with their Site Office colleagues while M&O contractors are present, they will likely encounter what Chris Argyris calls organizational defense routines; e.g., patterns-of-interaction that protect organizations (and the people in them) from blame, embarrassment, or threat.<sup>8</sup> Defense routines make it highly unlikely that “gaps” between the formal and informal rules will ever be detected or corrected because the fundamental rules of organizational defense routines are to: a) bypass such situations and act as if they are not happening, b) give inconsistent answers and “manage the meaning” of the situation by reinterpreting it (we said this, but we really *meant* that), c) make the bypass, inconsistent answers, and reinterpretations undiscussible, and d) make the undiscussibility undiscussible.<sup>9</sup> If NNSA manager continues to press his Site Office colleagues on the discrepancy between the formal and informal policies on oversight, they will likely be subjected to overt and covert social sanctions against making such situations matters of public discussion. These social sanctions may involve real or perceived retribution.

Over time, if circumstances force situations like the “gap” between the formal and informal policies on oversight into public awareness (it’s written up in the *Nuclear Weapons and Materials Monitor* or the *New York Times*), and if the organization recognizes the problem, makes a genuine commitment to course correction, and then delivers on that commitment, this sends a *constructive* message that narrows the “gap” between the formal and informal rules of the game. But if the organization maintains its defense routines and *survives* the confrontation, the gap widens and the fear of blame, embarrassment, and threat is intensified within the organization. Over time, as an organization survives repetitive confrontations, its defense routines are strengthened and its climate and culture become increasingly dysfunctional, duplicitous, and broken as described by the NRC Report.

So whatever change strategy NNSA adopts in the wake of the NRC Report and proposed legislation, it should begin by exploring three questions. First, how wide is the gap between its formally espoused policies and operating philosophy, and the informal ways things are “actually” being done? Second, how strong is the socio-cultural pressure to keep the gap undiscussible by both NNSA HQ and NNSA Site Office personnel? Third, what are the negative consequences for making the gap discussible?<sup>10</sup> My experience working in the Complex for almost 30 years has shown that the width of the gap, the pressure to keep it undiscussible, and the fear of negative consequences for making the gap discussible are large, and are some of the key issues that make transforming the DOE Nuclear Weapons Complex so difficult because there is no way to even begin having a meaningful conversation and dialogue about the problem and possible solutions. So the Design Principle for addressing this Common Cause should be for NNSA to introspectively explore and openly acknowledge the existence and magnitude of the gap between the formal (written) and informal (unwritten) rules for how things are done, and take the concrete action required to narrow (or eliminate) this gap.

### ***Common Cause #2: Consequences for Performance (Good and Bad) Are Linked to Visibility, Rather Adding Value***

Consequences for performance (good and bad) within NNSA are linked to “visibility” rather than adding value, where NNSA managers and their departments are often blamed (or praised) for negative events (or achievements) over which they had little or no control.<sup>11</sup> More specifically, the tendency within NNSA is to *blame* organizational performance problems (created by the structures,

systems, and culture) on individual managers and this tendency creates the risk-averse, overly prescriptive approach used by many NNSA managers and staff members. The Design Principle for addressing this Common Cause is to: a) realign the performance evaluation system and the Elements and Standards of NNSA managers and staff members to reward performance that adds value to NNSA's overall mission-purpose, and strongly discourages activities that don't, and b) to openly reward NNSA managers for removing or terminating Federal personnel from their work-role when their performance does not meet these expectations using a new streamlined process. Value-added oversight should be rewarded, and non-value-added (non-thinking) compliance-for-compliance-sake should be strongly discouraged, with tangible negative consequences that might include removal from their work-role or termination.

Linking consequences for performance (good and bad) to visibility, rather than adding value creates a culture of *self-interest* where managers and departments are informally rewarded for optimizing the visibility they obtain, even if it sub-optimizes the performance of other NNSA organizations, Labs, Production Plants, construction projects, or the overall Nuclear Weapons Complex. Linking performance to visibility rather than adding value is the Common Cause of what the NRC Report refers to as the "excessive number of uncoordinated, often conflicted reviews."<sup>12</sup> As described in Part I, this is a cultural problem that pre-dates the existence of NNSA as indicated in the 1995 Galvin Task Force Report, "Everyone wants in on the act – headquarters, DOE area offices, the DOE field office, program offices of the DOE, the Defense Nuclear Facilities Safety Board (DNFSB), the Department of Labor's office of Federal Contract Compliance, the EPA, the General Accounting Office (GAO) and the state where the lab is located. Each has oversight entities and each thinks their audit is the most important. There are also increased costs and productivity loss of those individuals, who are mostly scientists, interacting with these auditors."<sup>13</sup> The reason why "everyone wants in on the act" regardless of the negative effect on S&E activities is because *everyone wants visibility*.

This Common Cause is woven into the fabric of how most government organizations obtain their revenue and operate. The revenue for most government organizations at the federal, state, county, and municipal levels comes from appropriations granted by legislative bodies (Congress etc.), and these appropriated revenue streams powerfully shape and define the culture of government organizations. This is because the basis for increasing or decreasing revenue from appropriated funds is driven largely by political and economic issues, not the measured performance of the government organization. One of the best ways to characterize these differences is to compare the key elements that drive for-profit companies, with government entities. There are four drivers in for-profit organizations: a) business results, b) customer satisfaction, c) consequences for performance (good and bad), and d) the leadership and management needed to enact and energize the first three. Like the wind in the sails of a boat, business results and customer satisfaction are the driving forces that *link* for-profit companies to the business environment outside the organization. Consequences for performance (good or bad) that are based on well-defined measurements of organizational and individual performance are the indispensable drivers that enable managers to oversee day-to-day operations within the context of a company's structures, systems, and culture.

There are *no real equivalents* to business results, customer satisfaction, and consequences for performance (good or bad) in most government agencies – you can't "fire" the U.S. Department of Energy. In industry, if a company is not profitable it goes out of business. In government agencies, organizations and projects sometimes continue to exist long after their purpose is questionable, often for political and economic reasons. In industry, customer satisfaction is a bulwark of business results, competitive advantage, and process improvement. If customers are not satisfied, they buy elsewhere, the company's profits decline, and eventually the company goes out of business. In many government agencies, managers and staff members have endless debates

about whether they even have customers other than the ephemeral “taxpayer” or “future unborn generations.”

In industry, if a worker’s performance is exemplary because they meet or exceed their goals they are rewarded, and if performance is inadequate, the company can remove them from their work-role or terminate them. There are consequences for performance – good and bad – that are carefully linked to their performance to get the desired result of adding value to customers. In most government agencies, the difference between the raises and rewards given to high-performers and low-performers is often a few dollars a month. In fact, an unwritten (informal) cultural norm in many government agencies is that managers should not give accurate performance ratings to problem employees for fear that even the most incompetent workers will retaliate by filing grievances against the manager who dares to tell the truth about their inadequate level of performance. More importantly, even the remaining industry-type driver of leadership and management is largely undermined in most government organizations when top managers do not have the power and authority to remove or terminate people from their work-role even when their performance does not meet expectations and adds little or no value to the organization.

In the absence of revenue streams that are carefully linked to an employee’s ability to add value, the currency that “trades” in most government organizations is *power-through-visibility*. If a government organization or a manager is involved with a “change initiative” or “management program” that is well received by the agency leaders, the media, or the public; this creates the currency of positive visibility. If these same activities create negative visibility for agency leaders in the media or with the public, the result is blame, embarrassment, and threat from organizational defense routines. Given the current economic and political climate described in Part I, all sectors of government (including NNSA) are increasingly under pressure to demonstrate the applicability and value-added results of their services to meet public needs and this scrutiny generates either positive or negative currency in visibility. Government entities like NNSA are also under constant pressure to demonstrate that their operations are efficient and that they are using publicly generated funds responsibly which increases the importance of creating the currency of positive visibility. The “currency” of visibility is one of the most powerful culture-shaping forces in the government sector. So while Federal managers and staff fear the short-term cultural consequence of blame, embarrassment, and threat; they also fear the long-term consequence of being “fired” metaphorically. More specifically, the *formal* process for removing and terminating Federal employees is so protracted, energy-intensive, and painful that many managers use an *informal* process of “firing” people metaphorically by having their office moved to the organizational “basement” and their phone calls, mail, and meaningful projects redirected to others. Federal employees fear being made *invisible* by reassigning them to the glacially-paced “shadow” organization of Invisible Bureaucracy.

So it’s likely that many NNSA managers and staff members will actively (and passively) resist whatever change strategy emerges from the NRC Report and proposed legislation by maintaining the gap between: a) the formally written MOU, annual assessments, and reports to Congress, and b) the way they actually work in day-to-day operations. To this point in the article, we have defined four Design Principles: a) manage both change and transition, b) minimize bureaucracy and non-value-added compliance, c) acknowledge and narrow the gap between the formal (written) and informal (unwritten) rules for how things are done, and d) realign the performance evaluation system to reward performance that adds value and strongly discourage behaviors that don’t, and openly reward NNSA managers for removing or terminating Federal personnel from their work-role when their performance does not meet these expectations using a new streamlined process. The next section describes yet another reason why transforming the DOE Nuclear Weapons Complex is so difficult.

### ***Common Cause #3: Lack of Long Term Continuity in Leadership in NNSA***

There is no long-term continuity of leadership in NNSA to see the process of organizational transformation through to completion if political appointees lead the transformation process. Studies and extensive field experience have shown that in a mature organization where the structures, systems, and culture are well solidified (like DOE/NNSA) even when substantial resources are dedicated specifically to change efforts it takes between eighteen months to two years per level of organizational management changed.<sup>14</sup> MIT's cultural expert Edgar Schein states that with major cultural change initiatives the process can take more than fifteen years which would span more than three Presidential Administrations. So the lack of continuity in leadership at the political appointee level almost guarantees that organizational transformation is not attainable within the Nuclear Weapons Complex.

As part of its proposed legislation, Congress needs to more clearly define the roles and responsibilities of political appointees and long-term Federal managers within NNSA where political appointees provide direction (steer) and the long-term Federal employees execute (row). External customers like the Nuclear Weapons Council, Navy, and other appropriate entities described in the *2010 Nuclear Posture Review* should define the "what" that political appointees need to accomplish during their terms of service, and long-term Federal managers within NNSA should define "how" the HQ and Field structures, systems, and resources will be aligned to achieve those results. The successful implementation of this "what-versus-how" approach at the political appointee and long-term Federal employee level using the Design Principles defined in this article could then be used as a model for how value-added oversight should be performed for M&O contractors.

Let's explore some of the reasons why this radical approach to creating "enough change" is necessary if the goal is to actually transform the DOE Nuclear Weapons Complex. A complete term for a U.S. President is four years and it often takes six-to-eight months on the front-end of a Presidential Election to assemble the cadre of political appointees that constitute the President's Cabinet (including the Secretary of Energy) and other senior executives down to the NNSA NA-1, NA-10, NA-20, and NA-30 level. On the back-end six-to-eight months of a Presidential term, most political appointees are already looking for their next job or appointment. When a political appointee assumes their responsibility, it can take the first six-to-eight months for them to become familiar with the roles, responsibilities, and authorities of the new job. So most political appointees only have a little over two years in their position before they have to begin facing the reality of moving on.

Because this operational instability is built into the very fabric of the U.S. governance philosophy, it's the long-term Federal employees in GS and SES positions who are supposed to provide continuity and stability across Presidential administrations. As mentioned previously, the formal (written) rule for how things get done in DOE is that the political appointees provide direction (steer) and the long-term Federal employees execute (row). This can be a political appointee's best friend or worst enemy. When the desired results of a new political appointee are aligned with the structures, systems, and culture of long-term federal employees that have solidified over decades, or when these desired results are viewed as being in the "best interest" of long-term Federal employees' need for positive visibility, the results are more likely to be achieved. But when the desired results of a political appointee are misaligned with the structures, systems, and culture within which Federal employees have learned to work, or when they are not viewed as being in the "best interest" of the long-term Federal employees, then the desired results have little or no chance of actually being achieved.

The ground rules for this "cultural dance" are well-known to both the political appointees and the long-term Federal employees, but they are the tacit, underlying, beliefs, values, and attitudes about "how things are done around here" that are not publicly discussible. For example, the Secretary of

Energy issues formal direction to develop the MOU recommended by the NRC Report. Most long-term Federal appointees will be very responsive to this direction and quickly produce an Action Plan for getting the Secretary what he/she wants. Enormous amounts of time, energy, and activity will be invested in creating the Action Plan document in the form of meetings, writing assignments, off-site retreats, phone conferences, etc. When complete, the MOU is formally transmitted throughout DOE/NNSA with a great sense of urgency that announces, “This is the Secretary’s highest priority.” But as described in the previous two Common Causes, there will be a “gap” between the formal (written) direction of the MOU, and the informal (unwritten) cultural direction that views it as another flavor-of-the-month change initiative that has little hope of changing the status quo within NNSA. Over time when the Secretary discovers that little or no progress has been made on achieving the actual *outcomes* of the MOU and he/she tries to hold long-term Federal employees accountable for this lack of progress, the response is often to develop another Action Plan (or committee) that will ensure that *this time* the MOU gets implemented. Once again, enormous amounts of time, energy, and activities will follow in the development of this second Action Plan, but more times than not there will be little or no progress in actually changing the status quo of day-to-day operations. The recorded history of five U.S. Presidents and eight Secretaries of Energy described in Part I shows that if long-term Federal employees wait long enough, a different set of political appointees will arrive in DC after the next election and the process will begin all over again with different goals and objectives.

So while the formal (written) rules for how things get done in the cultural context of the Federal system are that the political appointees provide direction (steer) and the long-term Federal employees execute (row), the informal (unwritten) rules for how things *really* get done are defined by long-term Federal employees who have shaped and defined DOE/NNSA’s organizational structures, systems, and culture for decades. In other words, it’s the long-term Federal employees who really “run” the operations of DOE/NNSA, *despite* the formal public perception that the Secretary of Energy and other political appointees are in charge. This cultural reality has been concretized into a metaphor that is known and understood by both political appointees and Federal employees; e.g., the political appointees are the A-Team, and long-term Federal employees are the B-Team because the career Federal employees, “Be here when they come, and they be here when the A-Team goes.” It is important to note that this cultural reality has been isomorphically mirrored down into contractor organizations through the use of M&O contracts, where the long-term Lab and Production Plant employees who have worked for multiple M&O contractor organizations refer to themselves as “We-Bes” to affirm their loyalty to the physical “site” rather than to the M&O contractor that happens to be running the site at that specific point in time.

So to reiterate – the lack of continuity in leadership at the political appointee level almost guarantees that organizational transformation is not attainable because political appointees are not around long enough to create the kind of long-term change required for organizational transformation. Congress needs to more clearly define the roles and responsibilities of political appointees and long-term Federal managers within NNSA where political appointees provide the “what” direction (steer) and the long-term Federal employees execute the “how” of getting the work of transforming NNSA done (row). Congress should memorialize this approach in new legislation that holds long-term Federal managers within NNSA directly accountable for developing concrete solutions to the findings and recommendations in the NRC Report and for eliminating creeping bureaucracy.

### ***Transition***

So whatever change strategy is developed by NNSA and its M&O contractors, the best way to ensure that the Nuclear Weapons Complex is transformed is to *begin* by transforming NNSA using the four Design Principles, and then reflecting these changes in M&O contracts and award-fee-based

performance objectives. Because the three interdependent Common Causes are woven so deeply into the DOE/NNSA culture, even small changes in these three areas will have an enormous positive impact on reducing (or eliminating) excess formality of operations, and reducing the level of fear and mistrust within the NNSA/M&O relationship.

To continue on and read Part III of this article, use an Internet search engine like Google or Bing to search for the title, *Rebuilding Trust in the DOE Nuclear Weapons Complex*.

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### ***End Notes***

<sup>1</sup> See National Research Council, *Managing for High-Quality Science and Engineering at the NNSA National Security Laboratories*, Prepublication, (Washington, DC: The National Academies Press, 2012).

<sup>2</sup> A description of the proposed legislation to shift the Uranium Processing Facility (UPF) and Chemistry and Metallurgy Research Replacement-Nuclear Facility (CMRR-NF) to the Department of Defense (DOD) can be found in Exchange Monitor Publications Inc, *Nuclear Weapons & Materials Monitor*, May 11, 2012 Volume 16, Numbers 21, pp. 2-4.

<sup>3</sup> For a discussion of this Common Cause see, Mark Bodnarczuk, *Making Invisible Bureaucracy Visible: A Guide to Assessing and Changing Organizational Culture*, (Boulder, CO: Breckenridge Press, 2009), p. ix.

<sup>4</sup> This is taken from the cover letter from John Foster (Panel Chairman) to Senator Carl Levin, Chairman of the Committee on Armed Services that transmitted the final report entitled, *FY 2001 Report to Congress of the Panel to Assess the Reliability, Safety, and Security of the United States Nuclear Stockpile*.

<sup>5</sup> See National Research Council, *Managing for High-Quality Science and Engineering at the NNSA National Security Laboratories*, Prepublication, (Washington, DC: The National Academies Press, 2012), p. 4.

<sup>6</sup> See James C. Collins and Jerry I Porras, *Built to Last: Successful Habits of Visionary Companies*, (New York: Harper Business, 1994), pp. 43-44 ff.

<sup>7</sup> See National Research Council, *Managing for High-Quality Science and Engineering at the NNSA National Security Laboratories*, Prepublication, (Washington, DC: The National Academies Press, 2012), p. 26 ff.

<sup>8</sup> See Argyris, *Overcoming Organizational Defenses*, (Upper Saddle River, NJ: Prentice Hall, 1990).

<sup>9</sup> See Argyris, *Flawed Advice and the Management Trap*, (Oxford: Oxford University Press, 2000), p. 22 ff.

<sup>10</sup> For a more complete discussion on this Common Cause see, Bodnarczuk, *Making Invisible Bureaucracy Visible*, p. 32.

<sup>11</sup> See Mark Bodnarczuk, *Making Invisible Bureaucracy Visible: A Guide to Assessing and Changing Organizational Culture*, (Boulder, CO: Breckenridge Press, 2009), p. 165.

<sup>12</sup> See National Research Council, *Managing for High-Quality Science and Engineering at the NNSA National Security Laboratories*, Prepublication, (Washington, DC: The National Academies Press, 2012), p. 53.

<sup>13</sup> See U.S. Department of Energy, *Report of the Task Force on Alternative Futures for the Department of Energy National Laboratories*, Prepared by the Secretary of Energy Advisory Board, 1995.

<sup>14</sup> See Edgar Schein, *Corporate Culture Survival Guide*, (San Francisco, CA: Jossey-Bass, 2009), p. 132.