

New Mexico State University

# ARROWHEAD CENTER

LEADING ECONOMIC DEVELOPMENT FOR NEW MEXICO STATE UNIVERSITY



## Strategies for Overcoming Key Barriers to Development of a National Security Workforce

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Live, Learn and Thrive

# Table of Contents

1.0	Introduction .....	1
2.0	Strategies and Key Barriers .....	1
2.1	Education.....	1
2.2	Security Clearance.....	3
2.3	Diversity .....	4
2.4	Recruitment.....	5
2.5	Retention .....	5
3.0	Conclusion.....	6

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# Strategies for Overcoming Key Barriers to Development of a National Security Workforce

## 1.0 INTRODUCTION

This report documents the strategies for overcoming identified key barriers to development of an adequate national security workforce as part of the National Security Preparedness Project (NSPP) being performed under a Department of Energy (DOE) National Nuclear Security Administration (NNSA) grant. This report is due June 30, 2008, as performance measure 3.3.2 (Grant No: DE-FG52-07NA28084, Arrowhead Center proposal, Page 17).

Many barriers currently exist that prevent the development of an adequate number of properly trained national security personnel. The identified strategies to address the barriers will focus on both short-term and long-term efforts, as well as strategies to capture legacy knowledge of retiring national security workforce personnel.

## 2.0 STRATEGIES AND KEY BARRIERS

### 2.1 EDUCATION

Continuous and rapidly changing technological innovations often require new and advanced technological skill sets. By the time a workforce is trained in a new technological innovation, that technology has already changed making it difficult for training and education programs to stay up to date. This creates a shortfall in the workforce that affects both public and private sector. It is a vicious cycle that perpetuates the shortage of a properly trained and skilled workforce. When properly trained and skilled employees are hired, it is important to provide continuous skill improvements and training to ensure they remain current in their technological knowledge and skills.

**Strategy:** To alleviate this shortfall, NNSA can accelerate efforts to work directly with educational institutions that are in close proximity to NNSA physical locations. NNSA employees can provide insight into the types of employees required, as well as the skill sets necessary. The educational institutions, in partnership with NNSA personnel, can provide the identified training in a hands-on, technology-mediated manner at both the educational institution and NNSA. Once this process is vetted, it can be expanded to all interested educational institutions across the nation.

To compound the situation, often a disconnect between educators and industry exists. Educators are not necessarily preparing students for real-world employment possibilities in either the public or private sectors. Add to that a shortage of qualified educators in key academic departments and the shortage of a skilled workforce is further exacerbated.

**Strategy:** Educators generally prepare the workforce on what they think business and industry need in terms of workforce without much interaction with business and industry. By working closely with educational institutions that are in close proximity to NNSA physical locations, NNSA can be assured that the future workforce is being trained and educated with the proper skill sets. NNSA personnel can be involved curriculum development as well as the education process in either a volunteer or an adjunct capacity. This close relationship also will provide students with hands-on, real-world learning experiences and

opportunities to see the relevance of the material they are learning. A shortage of qualified educators in key academic departments directly affects the development of the NNSA workforce. NNSA employees make great volunteer and part-time educators in these departments and can provide students with a wealth of “real-life” experiences in the classroom.

Student interest in a number of critically important fields and specialties such as physics, chemistry, and engineering has been in long-term decline. This can be attributed to several factors such as poor educational STEM (science, technology, engineering, and math) preparation in primary, middle, and high schools, as well as a suppression of inquiry and imagination in middle and high schools. Poor educator preparation in these fields can be manifested because of no real-world experience and a lack of accountability for instructors and institutions.

**Strategy:** To address the referenced student interest decline, NNSA employee volunteerism with local school districts is a recommended approach. It is important for elementary, middle, and high schools students to realize that math and science can be fun, and this can be a good way to stimulate inquiry and imagination and prime the pump for future NNSA employees. Another approach to closing this gap is providing internships for students at an early age, which can help not only to provide future opportunities, but also to spark their interest in national security oriented jobs. These steps will help to increase competence and interest in STEM fields and result in increased student interest in employment with NNSA. NNSA can grow opportunities to work with local school districts to provide summer opportunities for educators to experience NNSA through courses, internships, and hands-on projects.

The lack of involvement by parents and communities also contributes to a lack of interest in these fields and a misunderstanding of current and future career paths. Therefore, students are not properly informed by educators of the potential in these fields. The most notable factor is the lack of importance of science and technology in the national conscience, and the perception that true expertise in these fields is not currently valued in society.

**Strategy:** A recommended strategy involves NNSA personnel participation in local school districts and communities. Interaction with parents and involvement in community activities makes NNSA approachable and opens the door for positive communications that can lead to interactions with students and educators. Providing educators with information regarding current and future career paths in the STEM fields will allow students to be better informed about potential career opportunities.

Often secondary and post-secondary students do not realize the immense opportunities available in the science and engineering fields, and many do not enter these fields as a result. Students often lack mentors or role models in the fields of science and engineering. When added to the fact that students live in a society in which everything is available immediately, numerous years of educational preparation for employment in the national security fields is not attractive. Further, the prohibitive cost of post-secondary education is a major determining factor.

**Strategy:** Both active and retired NNSA personnel make great mentors and role models. Therefore, involvement of NNSA personnel in local school districts and post-secondary institutions, on both a volunteer and an adjunct basis, is recommended. Retiring NNSA employees hold a wealth of legacy knowledge that can be valuable in the classroom. It is imperative that students begin to realize that post-secondary education has lifelong benefits and that financial aid is

available for the majority of students to assist with post-secondary education expenses. Other incentives that are currently or may be applied include scholarships, internships, part-time programs, guarantee that skills will be used, job security, summer internships with interesting work, non-need-based scholarships, paid internships, and higher government agency salaries.

Current NNSA employees with an associate's degree come with a special set of circumstances. The pay scale is often lower, whereas the employment positions typically are located in high cost-of-living areas. These employees are often less mobile. Relocation packages are not always generous or comprehensive enough to be attractive to this level of employee. It is imperative that continuing education be stressed with this level of employee so they will be current in their skills and remain viable employees.

**Strategy:** This level of NNSA employee often experiences a higher level of turnover. To avoid the high turnover rates, and related re-training periods, NNSA can continuously train these employees to ensure that they are highly skilled and remain valued employees. Rotation of current employees through the organization can serve to simulate training and integrate work teams and project management. Further, a study can be undertaken to determine the cost effectiveness of re-training following turnover versus increased relocation packages or higher salaries at the time of hire. When properly trained and skilled employees are hired at NNSA, continuous skill improvements and training can be provided in an effort to retain good employees.

Job forecasting for national security personnel is not used in an adequate manner. The current system for providing qualified employees to the science and technology community does not keep up with the requirements of the industry. True partnerships between government, industry, and academia are scarce. Oftentimes, resources are not properly leveraged.

**Strategy:** It is critical to promote strategies to leverage limited resources across government, industry, and academia. Programs such as volunteer educators from industry, funds for a summer internship program, and assistance with development of a "real-world" curriculum deserve emphasis.

There is a disadvantage created by not utilizing the huge available non-traditional talent pool. This pool of potential employees often is disconnected from the educational system and not utilized by current government and industry leaders. There is a definite need for employees with an associate's degree.

**Strategy:** To access the non-traditional talent pool, recruitment efforts can be made at local Department of Labor offices, community colleges, customized training facilities, GED preparation programs, veterans' programs, etc. Many of the people in this talent pool are looking for the next step, but do not know where to properly look or what is available. This is a good source of employees at the associate's degree level.

## 2.2 SECURITY CLEARANCE

The necessity of a security clearance by employees is often a barrier to employment with NNSA, and potential employees and students often are not informed of this requirement. Students may pursue an educational degree with an eye toward working for NNSA, only to find out after graduation they are not eligible for a security clearance, and thus not eligible for employment with NNSA. The generation currently in secondary and post-secondary education is experiencing higher incidence of drug use or driving under the influence of alcohol or felony convictions that prohibit them from qualifying

for a security clearance. Drug use can be overcome; however, the latter two are permanent conditions that result in a permanent inability to obtain a security clearance.

**Strategy:** Although changes to the security clearance process currently are being discussed, NNSA must live within the current system at this time. It is clear that the need for a security clearance should be discussed and explored early and often with students in middle and high schools. NNSA personnel who either volunteer or work part-time in schools can place a high level of importance on this concept. Students need to be aware of the consequences of having a criminal record, and the effect it will have on their future before they actually have a criminal record. Further, educators should be made fully aware of the security clearance process and pass that information along to their students.

A long-standing problem with a myriad of causes and consequences exists in the actual security clearance process. Recent legislation addressed a number of the issues that could lead to some improvements.<sup>1</sup> However, critical improvements are still needed in the areas of investigation and adjudication backlog, reciprocity and portability, standardized data, and process. This is coupled with the long-held government belief that there are too many security clearances at this time, the over-classification of positions, documents and information, and current technological barriers.

**Strategy:** Improving the security clearance process will require the investment of time and resources. There are a number of different agencies currently trying to address this problem, and NNSA is a key stakeholder in this process.

An entire cadre of fully trained employees that could contribute to the national security workforce currently is not able to qualify for a security clearance. As a result, there is strong competition for employees with a security clearance that are skilled and properly trained. This leads to a work environment that is often intense and employees that suffer from burnout and are difficult to retain.

**Strategy:** Educating students in middle and high schools about the requirements of a security clearance, as well as the opportunities that accompany it is imperative. These efforts will decrease the number of students who graduate with the degrees that are desirable to NNSA, but are not able to obtain a security clearance. Increasing the number of national security employees that are properly skilled, trained, and credentialed will also serve to alleviate the hiring away of NNSA employees and lead to a less intense work environment.

### 2.3 DIVERSITY

An inclusive and diverse workforce is difficult to obtain. There is an under-representation of minorities and women employees at the NNSA. This is compounded by the fact that there is a lack of mentoring and role models and a high level of peer pressure. Additionally, there is often a lack of clear articulation of degrees and time horizons, and the view that graduate degrees only translate into teaching positions.

**Strategy:** With the lack of minorities and women in the national security workforce, it is important to specifically target these groups. Recruitment efforts involving minority-owned newspapers and trade organizations may be productive. Universities with a diverse student population can be targeted for recruitment, as well as sponsorship of events hosted by ethnic organizations. Marketing strategies

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<sup>1</sup> United States Congress (n.d.). 2004 Defense Authorization and National Intelligence Reform Acts. Retrieved December 4, 2007, at <http://www.cbo.gov/ftpdoc.cfm?index=5841&type=0&sequence=0>

can be tailored to different ethnic groups to attract a diverse employee base. Female and minority NNSA employees, by becoming involved in their schools and local communities, can show young females and minorities the interesting possibilities available.

As a result of an inadequate level of a skilled national security workforce, strong competition exists for those that are properly trained. The widespread use of technology enables potential employers to have constant contact with current NNSA employees. The lure of the private sector, which often yields more generous salaries and benefits, is very appealing.

**Strategy:** The competition for well-qualified employees is intense, so it is important to focus on the qualities that make NNSA stand out as an employer. Some examples include opportunities for travel, secure employment, vacation time, sick leave, good benefits, good management, diverse workforce, flexible schedules, tuition reimbursement programs, opportunities for advancement, work-from-home, etc.

## 2.4 RECRUITMENT

Many reasons exist why secondary and post-secondary students don't think of career opportunities in the national security fields. Especially with female and minority students, an image problem exists with the fields of engineering and science. Many students are unaware of the wide variety of opportunities available. Extra curricular programs involving math, engineering, and the sciences are rare. These types of programs could serve as recruitment tools for educators and provide opportunities to expose students to possible careers at the NNSA.

**Strategy:** Beyond traditional recruitment methods, approaches such as providing incentives to current NNSA talented employees to help recruit friends and acquaintances can be inexpensive and successful. Employee referrals have several advantages: the cost-per-hire is less; candidate quality is usually higher because the recommendation comes from a reliable source; and the rate of attrition is lower.<sup>2</sup> Educators, as well as post-secondary institutions, can serve as a valuable referral source. Mechanisms already in place, such as Internships and co-op positions, also serve as a valuable recruitment tool.

## 2.5 RETENTION

A high turnover rate among young professionals occurs at NNSA. This happens between seven and eight years of experience and has been linked to a lack of challenging work, layoffs, base closures, completion of educational commitments, completion of military commitments, lucrative opportunities in private business and industry, and lack of incentives to remain at NNSA.<sup>3</sup>

**Strategy:** Employee retention is best done through offering exciting work, an inviting culture, and adequate pay. Research may be useful to determine what efforts/programs would be helpful in retaining young professionals. The attraction may not mean additional income. It could be in the form of a creative

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<sup>2</sup> [http://findarticles.com/p/articles/mi\\_m0HMU/is\\_3\\_30/ai\\_98695222](http://findarticles.com/p/articles/mi_m0HMU/is_3_30/ai_98695222)

<sup>3</sup> National Security Workforce: Challenges and Solutions Workshop (NDIA, AIA in collaboration with DDR&E) (n.d.). Retrieved December 5, 2007, from [http://www.ndia.org/Content/NavigationMenu/Meetings\\_and\\_Events/Past\\_Events/534E\\_National\\_Security\\_Workforce.htm](http://www.ndia.org/Content/NavigationMenu/Meetings_and_Events/Past_Events/534E_National_Security_Workforce.htm)

compensation package such as flexible work hours, gym memberships, on-site daycare, additional vacation time, and/or telecommuting. The newest employees have a different definition of employee satisfaction, which needs to be explored and incorporated. NNSA can work to ensure that the correct employee is hired for a specific position as this will result in less job frustration and lower turnover. All employees want to feel valued, be a part of the team, and contribute to the end result.

### **3.0 CONCLUSION**

The majority of the barriers to the development of an adequate and properly trained workforce rest with the educational system. These are not barriers that have developed in the short-term; these barriers have been in existence for many years. This report makes it clear that educational institutions cannot continue to educate students in a “business as usual” manner. Much is to be gained by everyone when educators — in partnership with NNSA — work to inform students, especially female and under-represented students, of potential opportunities in science and engineering and provide the students with a technology-mediated, project-based educational effort.

According to NNSA, “The talent we need is a diverse and dynamic blend of experience and youth; a mixture of top-performing program experts, rounded out by talented newcomers with unbounded potential and eagerness who are dedicated to public service and the stewardship of the Nation’s most important national security programs.”<sup>4</sup> Working together, NNSA, educators, and industry can develop the new ideas, curricula, and approaches necessary to ensure an adequate number of trained and properly skilled national security workforce personnel.

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<sup>4</sup> <http://humancapital.doe.gov/pol/hcmp/pdf/NNSAHCMSP.pdf>