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# **A Sandia Nuclear Weapon Knowledge Management Program Plan For FY 1998–2003**

## **Volume I Synopsis**

Military Liaison and Knowledge Management Center  
Sandia National Laboratories  
P.O. Box 5800  
Albuquerque, NM 87185-0631

### **Abstract**

This volume contains a synopsis and briefing charts for a five-year plan which describes a Knowledge Management Program needed to meet Sandia's responsibility for maintaining safety, security, reliability, and operational effectiveness of the nuclear weapon stockpile. Although the knowledge and expertise required to maintain and upgrade the stockpile continues to be critical to our country's defense, Sandia's historical process for developing and advancing future knowledge and expertise needs to be addressed. This plan recommends implementing an aggressive Knowledge Management Program to assure retention and furtherance of Sandia's expertise, beginning in fiscal year 1998, as an integrated approach to solving the expertise dilemma.

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# **A Sandia Nuclear Weapon Knowledge Management Program Plan For FY 1998–2003**

## **Volume I Synopsis**

### **Introduction**

On January 11, 1997, Roger Hagengruber, Sandia vice president for National Security Programs, funded the Knowledge Management Program team to deliver a long-range knowledge management program. The program supports the Sandia corporate objective to “. . . *maintain the vitality of the scientific- and engineering-based capabilities and expertise needed to perform our nuclear weapons mission both now and as the nation demands in the future.*” This report contains a synopsis of the plan and briefing charts, which is fully documented in SAND97-3083/2, “*A Sandia Nuclear Weapon Knowledge Management Program Plan for FY 1998-2003, Volume II, Planning Document.*”

### **Background**

Nuclear weapon knowledge is the unique skills and expertise of the people who have supported the nuclear deterrent for nearly 50 years, along with the data, information and Laboratories’ capabilities needed to solve the problems of the future. The Knowledge Management Program is the collecting, sharing, application and adaptation of this unique knowledge to support the nuclear deterrent for the foreseeable future.

Although the knowledge and expertise required to maintain and upgrade the safety, security, reliability and operational effectiveness of the nuclear weapon stockpile continues to be critical to our country’s defense, Sandia’s process for developing and advancing that knowledge and expertise for the future needs to be addressed. This plan recommends that Sandia implement an aggressive Knowledge Management Program to assure retention and furtherance of its expertise, beginning in FY98, as an integrated approach at solving the expertise dilemma.

As we examine Sandia’s recent environment and look at projections for the future, we see many factors that impact the traditional approach Sandia has taken to knowledge management. For example, engineers and scientists have always passed along their skills to new people through on-the-job training on multiple weapon development and test projects. However, we have not had a full-scale systems development for 10 years, the

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stockpile is much smaller, our budgets have steadily declined, and few new people have joined the weapons program.

Demographic analyses since 1990 show that a generation of the most experienced engineers have left Sandia or are leaving, the current generation has less experience and practice, and the next generation has not been hired. It also shows that fewer recent college graduates are being hired, and our attrition rates have increased from the past. Yet the importance of the nuclear deterrent continues to be affirmed. Our challenge is to maintain the stockpile indefinitely in a safe, secure, reliable, and operationally effective manner without nuclear testing. We must retain the confidence in ourselves and the stockpile for our Department of Defense customers, the Department of Energy, and the public.

Fortunately, we face this great challenge with opportunities. The problem of maintaining nuclear competence is widely recognized in the nuclear community and not unique to Sandia. Therefore, we will be encouraged and supported to achieve well-articulated knowledge management goals. In most cases, people are still available to provide and identify the necessary data and information. We have world-class tools and capabilities. Computing and information technologies provide a basis to support the people who will carry on these responsibilities. We must take advantage of these opportunities while the window remains open. Every engineer and scientist must maintain past knowledge and, more importantly, advance and modernize their knowledge for the future.

## **Plan Requirements**

The goal of the Knowledge Management Program is to support the line with a program that withstands scrutiny for maintaining, advancing, and transferring the required nuclear weapon knowledge to ensure a safe, secure, reliable and operationally effective stockpile.

The requirements for development of the program plan were to:

- (1) support the organizational structures that are responsible for the nuclear weapons mission in an affordable and value-added manner commensurate with its costs;
- (2) integrate with technical projects, sector roadmaps, Chief Information Officer and Human Resources processes and tools;
- (3) ensure that nuclear weapons engineers and managers are demonstrably qualified and/or certified by a process that is able to withstand external scrutiny by stressing competency and performance;
- (4) provide opportunities for education for Sandians; and
- (5) include people, data and information and capabilities.



## **The Proposed Knowledge Management Program--Creating the Successors for Sandia's Nuclear Weapons Experts**

We conclude that Sandia must take positive action, beginning now, to ensure a sufficient quantity of experienced weaponeers to sustain and advance the stockpile. The plan's vision of the future is that engineers, scientists, and decision makers who maintain the nuclear deterrent demonstrably merit the nation's confidence. The advancement of their nuclear weapon knowledge (through their successors, data and information, capabilities, and projects) earns the continuing confidence of the nation.

We envision the Knowledge Management Program to be completely in place by the year 2003. The people have the knowledge of the past and the skills and tools necessary to make and implement the decisions of the future. Key functional areas, which are critical to the weapons mission, are identified. These areas are continually analyzed by cognizant department and project managers for the expertise, information, and capabilities needed to meet current commitments and sustain the mission. For this vision to succeed, we will need:

- **Challenging work.** Important, challenging, and meaningful job assignments are essential. On-the-job training and mentoring continue to be the most important elements of knowledge transfer and understanding.
- **Management commitment.** The maintenance, advancement, and transfer of knowledge from one engineer to another must be a fundamental daily commitment of every technical manager.
- **Efficient business processes.** Sandia must continue to evaluate and improve its nuclear weapons business processes and procedures.
- **Infrastructure.** Sandia must continue to provide quality modern integrated infrastructure (such as test facilities, laboratory equipment, and high-end computing) to our weapon engineering staff and managers.

For this vision to be effectively implemented, we will need to establish and follow a policy that emphasizes the importance of knowledge management. The program's policy statement follows.

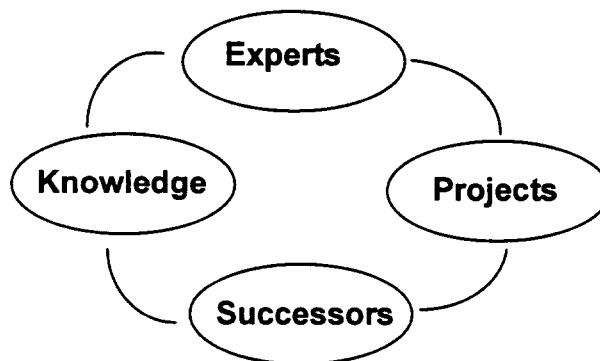
**KNOWLEDGE MANAGEMENT PROGRAM  
POLICY STATEMENT**

Every engineer, scientist, and decision maker must be demonstrably qualified to execute their responsibilities associated with maintaining the nuclear deterrent. They are expected to demonstrate individual initiative and invest in their own learning to continually improve their performance in the dynamic environment of nuclear weapons. It is essential that they maintain and advance the knowledge of the past as they encounter and use it in executing daily activities. They and their managers must further advance the knowledge by developing their successors, by maintaining data and information in a retrievable manner, and by maintaining the capabilities essential to the conduct of their responsibilities.

The weapons program leadership shall provide the opportunity for success through challenging work, adequate resources and tools, and educational alternatives. Skills and demographics will be managed so that backups for critical positions and losses because of transfer, retirement, or resignation do not impact any program. The leadership will make investment and disinvestment decisions based on integrated data on people, information, and capabilities. Success is measured by our individual and collective work results as reflected by the state-of-health of the stockpile and by the confidence our customers and the public express in us, now and in the future.

**The Knowledge Management Program - Approach for Creating the Successors**

As the figure below indicates, the KMP seeks to establish an integrated approach for capturing and transferring the knowledge possessed by today's experts for tomorrow's experts. To do this, we propose enhancing and developing staffing, career development, and succession planning to hire, retain and develop tomorrow's experts. Several major tools are needed to implement this integrated approach: (1) a knowledge management process, (2) the Nuclear Weapons Institute, and (3) a data and information management process.



The **Knowledge Management Process** is the tool that integrates the Knowledge Management Program. The process provides a structure to plan and implement knowledge management activities. The structure includes the identification of functional areas of technical expertise upon which to base the acquisition of the skills, expertise, data, information, and capabilities required to maintain the stockpile. The tentative functional areas list was derived from the Laboratory Capability Assurance Program and the DOE Report to Congress on the Stockpile Stewardship Recruitment and Training Program efforts, and accounts for nearly 200 departments. The process allows each department to identify and evaluate its specific future-based knowledge management needs and provides tools for implementing them. The logic flow is shown in Figure 1. The needs are aggregated by representatives from the functional area, called a standards board. This provides a consistent set of data that can be evaluated for corporate decisions about recruiting, educating and training people, and about investments in information and capabilities, as shown in Figure 2.

The **Nuclear Weapons Institute** will be the focal point of weapon education at Sandia and will coordinate training for Sandia personnel who maintain the stockpile and work in the defense programs nuclear weapons field. The Nuclear Weapons Institute will integrate existing training being given by various organizations and develop new training based on the results of the knowledge management process. Education and training will provide a full range of basic, intermediate, advanced, and assignment-specific courses to support the career goals and professional development of weapon personnel. The Nuclear Weapons Institute provides an Intern Program to ensure efficient and comprehensive education and training of new engineers about Sandia's mission, culture, business practices, processes, procedures, as well as thorough introduction to nuclear weapons in the stockpile and advanced technologies applicable to the stockpile.

**Data and information** are the tangible links of the past with the future. The knowledge management process for data and information management is very simple: all Sandia weapons data and information must be easily accessible (with the appropriate need-to-know). The plan calls for an integrated, distributed, multimedia "*Information Management Process*" which provides preservation, storage, and access to nuclear weapons data and information. The process includes format standards for the capture, storage, and exchange of electronic data, requires all existing data and information owners to migrate to them, and implements the Records Retention and Disposition Schedule file structure Lab-wide. We recommend the establishment of a central imaging capability for all defense programs data and information owners. Such a capability would ensure efficient, high quality, state-of-the-art production of electronic data and information. The organization would adhere to all standards, produce the metadata, and convert from image to electronic format if required. We must implement standards-based tools to provide the ability to search, access and use the data and information. We must implement a classified infrastructure. Finally, we must re-impose standards for distribution and storage of data and information created electronically. In addition, documenting lessons learned or best practices so future generations don't repeat past mistakes is critical.

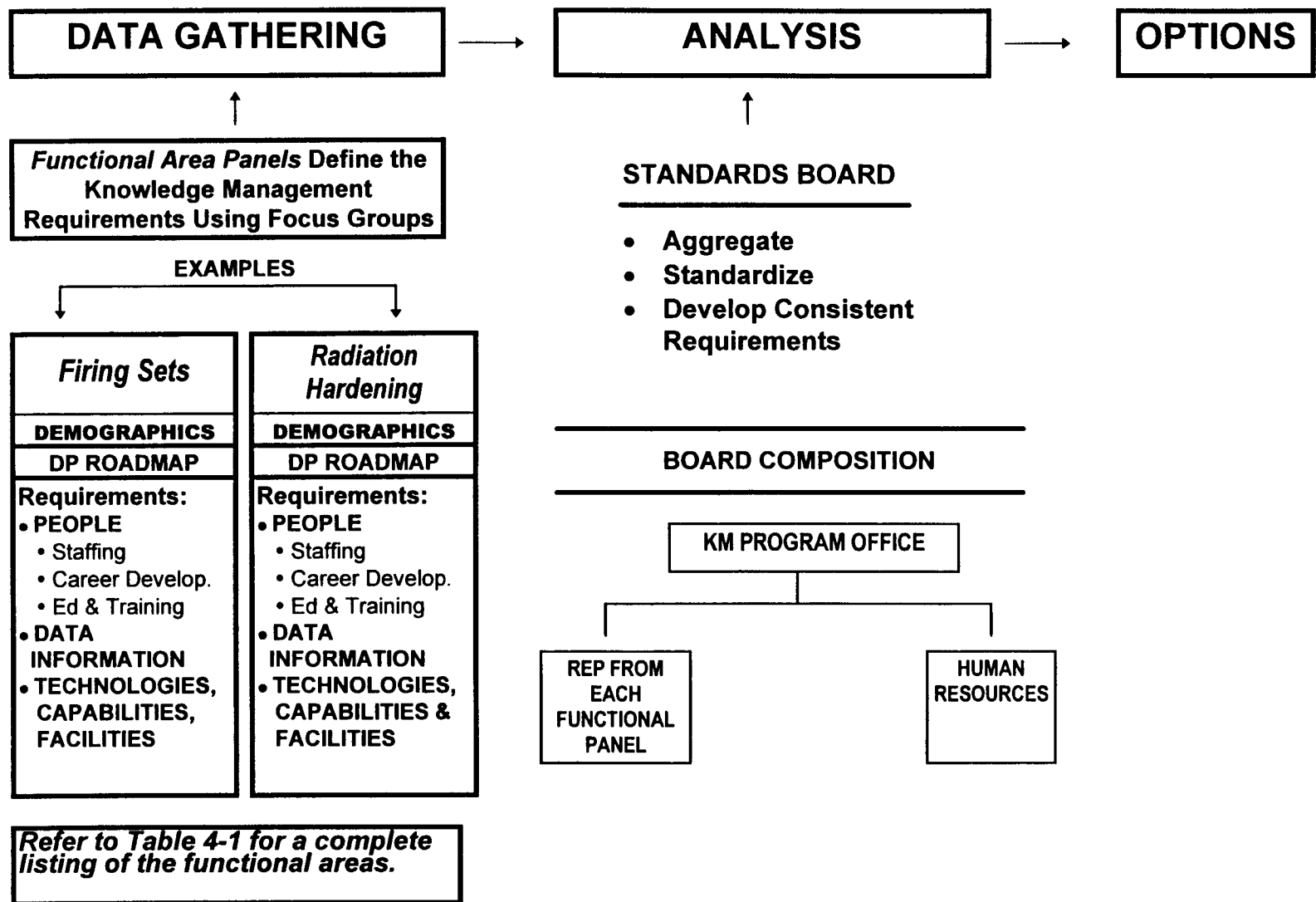
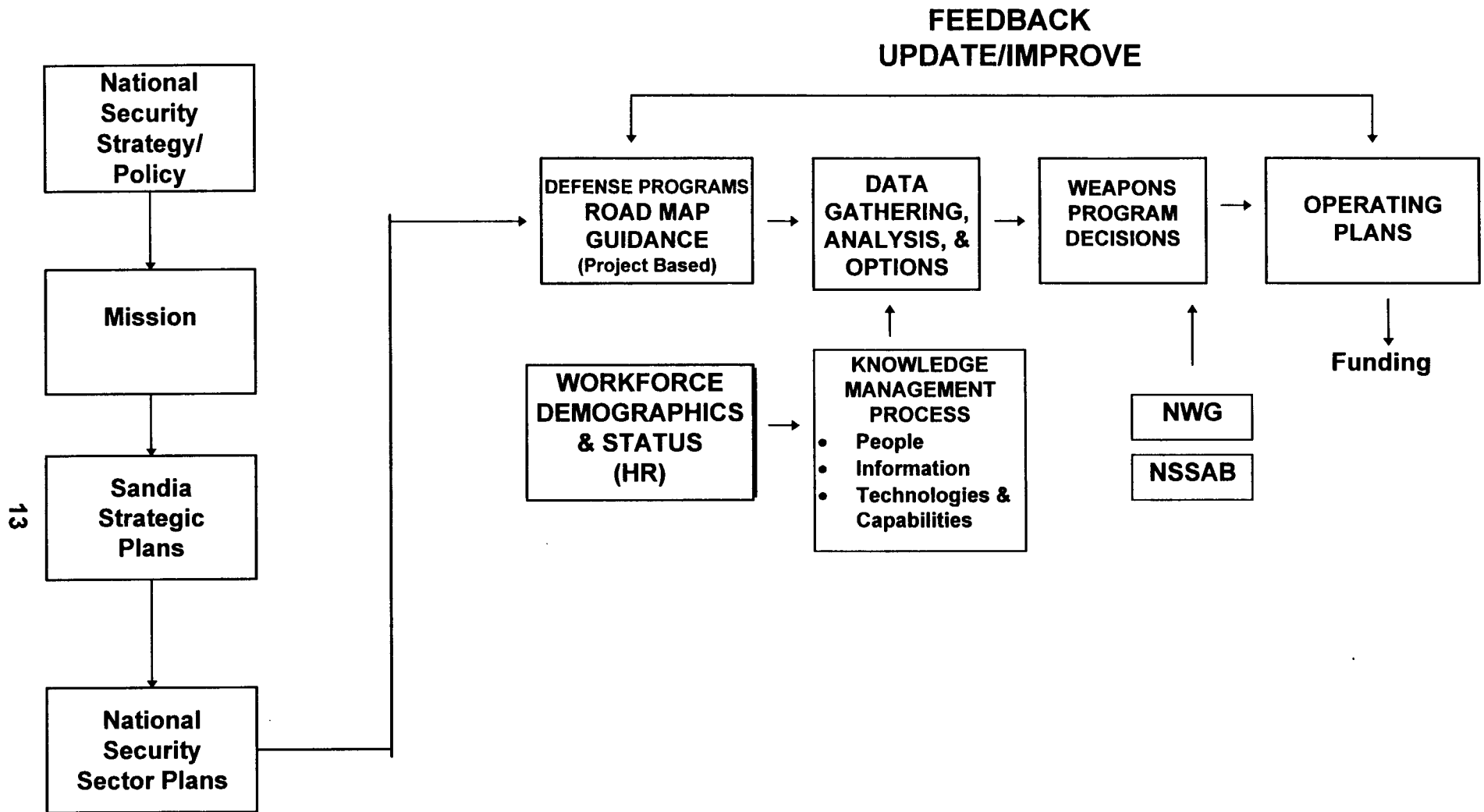


Figure 1. Knowledge Management Program Data Gathering, Analysis, and Options



**Figure 2. National Security Sector Decision Process Integrated with a Knowledge Management Program**

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## **People Development**

The most critical part of the plan deals with the development of people. The Knowledge Management Program goal for developing people is to “maintain the necessary scientific and technical skills to sustain and advance the stockpile.” Successors must be hired and developed based on the needs of the future. On-roll experts and retirees must support this career development. The plan recommends that career development, succession planning, staffing, and demographics analysis be implemented.

With the aid of their department manager, every person working weapons will complete an individual development plan providing for the orderly acquisition of the knowledge necessary to perform their project assignments. The Knowledge Management Program development plan will ensure that the engineer meets the standards for each of the elements of the career development structure as defined by department-specific criteria. Formal and informal education and training courses will be provided through the Nuclear Weapons Institute. Courses will be designed and taught to meet the needs of as many people as possible. System or component specific courses will be taught by internal experts.

Nothing can substitute for high-quality work assignments and access to the knowledge and understanding of senior experts (mentors). Mentoring can be between individuals or in group situations. Mentors are expected to encourage critical thinking in new engineers. Rotational assignments are intended to broaden an engineer’s exposure to advanced and complementary technologies, systems, designs, components, testing, and/or manufacturing issues.

A daring approach for paying qualified and certified engineers is recommended. The MTS who becomes weapon “qualified” becomes an SMTS and receives a five percent base salary increase for as long as the person maintains their qualification and works on weapon products. Weapons engineers who are promoted to PMTS, and whose job requires certification, will receive a 10 percent base increase for the duration of their certification and weapons work.

## **Capabilities Availability**

Sandia’s ability to accomplish its future mission depends on the availability of required capabilities to support the scientific and engineering staff. The strength of Sandia’s capabilities and facilities lie in the highly trained and knowledgeable people that operate them. Where appropriate, these scientists and engineers will be included in the career development process described above. We will determine specific requirements for capabilities, technologies and facilities in the knowledge management process. We expect to compile this information in the knowledge management data base to support impact analysis and decision making.

## Options to Achieve Future State Vision

We considered four options: (1) maintain the *status quo* (do nothing); (2) issue a knowledge management policy and maintain the *status quo*; (3) aggressively develop and implement a formal Knowledge Management Program starting in fiscal year 1998; and (4) delay commitment to an aggressive formal Knowledge Management Program, pilot a few key areas in fiscal year 1998, and further refine the program for a decision in summer of 1998.

**We recommend quickly issuing a policy document to establish the essential knowledge management principles and responsibilities and aggressively implementing the Knowledge Management Plan generally described here and detailed in Volume II.**

## An Implementation Plan

The Knowledge Management Program plan consists of three implementation tasks: (1) communicate the Knowledge Management Program plan and policy, (2) implement the knowledge management tools, and (3) implement people development systems. Figure 3 depicts the major deliverables and time lines of the plan that achieve our vision in 2003. The five-year incremental budget is estimated at \$16.5 million in FY 98 funds. Detailed cost estimates are shown in Table 1.

The first step is to establish a knowledge management program office to serve as a central resource for program functions. The duties of the office will be to (1) support knowledge management program process implementation, data and information gathering, database development and implementation, courses development and delivery; (2) support the newly created standards board; (3) produce status reports and recommendations for future activities; and (4) serve as an open line of communication to staff and management so that they will have a good understanding of the program's status, direction and plans.

The Knowledge Management Program will team and partner with existing projects in the National Security Sector office, Human Resources Division, centers reporting to the Chief Information Officer, the Weapon Systems Division, Surety Assessment Center, and Defense Products and Services Division.

Activities	FY 1998			FY 1999			FY 2000			FY 2001			FY 2002		
Plan & Policy Communicated	Δ														
Program Office	Δ							Δ							
Knowledge Management Process															
Functional Area Panels	Δ	Conduct Panels					Complete	Δ					Updates	Δ	
Standards Board	Δ	Meet Quarterly to Review Data and Make Recommendations													
Decision Model	Δ	Develop			Initial Report		Δ		Annual Reports	Δ		Δ			Δ
Nuclear Weapons Institute															
New Hire Orientation Class	Δ	Develop	Δ	Pilot	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
Intern Program		Develop		Pilot	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
Career Development Training	Δ	Develop						Aperiodic Classes to Meet Demand							
Retiree Seminar			Δ	Pilot		Δ	Expand		Δ	Annual Seminar		Δ			Δ
Facility Upgrade					Δ										Δ
Information Management Process															
Standards		Δ													
Legacy Data Conversion	Δ	Develop			Δ	Pilot	Δ	Continuing Process							
Classified Infrastructure				Δ											
Search and Access Tool				Δ											
Automated Metadata Creation					Δ										
Knowledge Preservation		Continue Current Projects													
Developing People															
Qualification Program		Δ	Develop				Δ	Required	Continuing Process						
Certification Program							Δ	Develop	Δ	Required	Continuing Process				
Mentoring Process		Δ	Develop				Δ	Implement	Continuing Process						
Rewards & Recognition Program							Δ	Develop	Δ	Implement					
Succession Planning Program		Δ	Develop				Δ	Implement	Continuing Process						
Retiree Augmentation Database	Δ	Develop	Δ					Annual Seminars in NWI (above)							
Automated Demographics	Δ	Analysis	Δ	Report				Δ	Annual Reports		Δ		Δ		Δ
Staffing Planning		Δ					Continuing Process								

Figure 3. Five-Year, Top-Level Milestones



**Table 1. Knowledge Management Program (KMP) Summary Tasks and Budget (\$K) In FY98 Dollars**

ACTIVITY	FY98	FY99	FY00	FY01	FY02
<b>Plan and Policy Communicated*</b>	25	*	*	*	*
<b>Knowledge Management Process</b>					
Functional Area Panels Facilitation	50	50	25	25	25
Standards Board	50	50	50	50	50
Computerized Decision Model	200	200	50	50	50
<b>Subtotal</b>	<b>325</b>	<b>300</b>	<b>125</b>	<b>125</b>	<b>125</b>
<b>Nuclear Weapons Institute (NWI)</b>					
KMP Manager	250	250	100	0	0
KMP Administrative Support	100	100	50	0	0
NWI Senior Engineer	300	300	300	300	300
Nuclear Weapons Institute Administration	250	250	250	250	250
New Hire Orientation Class	60	25	25	25	25
Intern Program Curriculum and Class	200	400	300	300	300
Career Development Classes	50	700	600	600	600
Retiree Seminar/Pay Retirees	60	25	25	25	25
<b>Subtotal</b>	<b>1270</b>	<b>2050</b>	<b>1650</b>	<b>1500</b>	<b>1500</b>
<b>Information Management Process</b>					
Nuclear Weapons Info Group Support	25	25	25	25	25
Knowledge Preservation Project	1200	1200	1200	1200	1200
Library History Project	75	75	75	0	0
Pilot Nonelectronic Data Conversion*	300	200	*	*	*
Classified Infrastructure*	100	*	*	*	*
<b>Subtotal</b>	<b>1700</b>	<b>1500</b>	<b>1300</b>	<b>1225</b>	<b>1225</b>
<b>Succession Development Process</b>					
Individual Development Plan Template*	100	*	*	*	*
Qualification Standards Definition*	100	*	*	*	*
Certification Standards Definition*	0	150	*	*	*
Automated Demographics*	50	*	*	*	*
Staffing Planning*	25	*	*	*	*
Rewards and Recognition Process*	25	*	*	*	*
Rewards for Qualification/Certification†	†	†	†	†	†
Succession Planning*	25	*	*	*	*
Retiree Augmentation Database*	30	*	*	*	*
<b>Subtotal</b>	<b>355</b>	<b>150</b>	<b>*</b>	<b>*</b>	<b>*</b>
<b>TOTAL KMP BUDGET</b>	<b>3650</b>	<b>4000</b>	<b>3075</b>	<b>2850</b>	<b>2850</b>
<b>Related Projects</b>					
Standards*	450	*	*	*	*
Search and Access Tool*	750	500	*	*	*
Automated Data Creation*	500	250	*	*	*
Interns (50 per year at 0.5 FTE)	0	2500	5000	5000	5000
NWI Facility Upgrade‡	250‡	250‡	150‡	2000‡	7500‡
<b>TOTAL RELATED PROJECTS BUDGET</b>	<b>1950</b>	<b>3500</b>	<b>5150</b>	<b>7000</b>	<b>12500</b>
<p>* One-time start-up costs; maintenance assumed to be cost of doing business.          † Not estimated; reallocation of existing funds.          ‡ Preconceptual cost estimate (revitalize Bldg. 892), draft, justification for critical decision 1, NWI, December 1996, page 4d-6. Architectural Research Consultants, Inc. NSS decision forthcoming on either capital or expense-funded project. If capital dollars funded, project start is FY01; project end is FY04; FY03 funding at \$13.5M, FY04 funding at \$7M. Total estimated cost is \$30M. FY98-FY00 budget (\$650K) for CDR and validation process.</p>					

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The budget estimate for the program is not large, because the costs do not include the costs to the line organizations of implementing the program, since it is assumed that the steps are part of the normal way that business is done, and that tradeoffs will be made to put high priority on knowledge management. The costs also do not include the costs for normal HR services and the CIO, because it is assumed they are already funded to meet the primary weapon mission requirements. Corporate development and education costs are especially called out because they are not budgeted for weapons classes at this time. It assumes that the program funds only new tasks, that the line will incorporate it as normal business, and that support organizations will give high priority to knowledge management. The five-year incremental budget in FY98 dollars is estimated at \$3.6M in FY98, \$4.0M in FY99, and \$3.1M in FY00. After that, a steady-state maintenance budget of approximately \$2.9M is estimated.

**APPENDIX A**  
**Briefing Charts**

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# The Sandia Corporate Objective

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***“..maintain the vitality of the scientific- and engineering-based capabilities and expertise needed to perform our nuclear weapons mission both now and as the nation demands in the future...”***

A-3

NW-B98.1

Develop and implement a Knowledge Management plan.



CAY:RLH1013:9/30/97

# Knowledge Management

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- ◆ ***Nuclear Weapon Knowledge*** is the unique skills and expertise of the people who have supported the nuclear deterrent for nearly 50 years, along with the data and information and laboratories capabilities needed to solve the problems of the future.
- ◆ The ***Knowledge Management Program*** is the collecting, sharing, application and adaptation of this unique knowledge to supporting the nuclear deterrent for the foreseeable future.

# Why a Knowledge Management Program?

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- **Our challenge: maintain the nuclear deterrent indefinitely.**
- **The Cold War is over--our emphasis has changed:**
  - The stockpile is smaller with no new systems.
  - Experienced staff is leaving, few new people.
  - Emphasis is on maintenance & life extension of the stockpile.
- **We have a window of opportunity to identify and preserve the data & information & essential capabilities of the past for the people who will make and implement the decisions of the future.**
- **We must retain the confidence of our DoD customers, the DOE and the public in both the stockpile and in ourselves.**

A-5

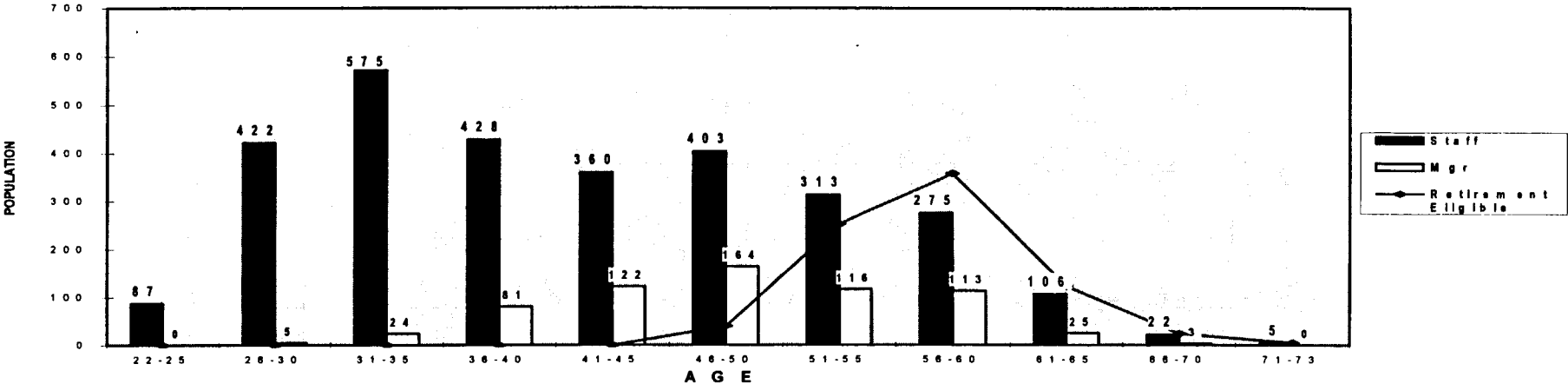


# Developing People is Critical

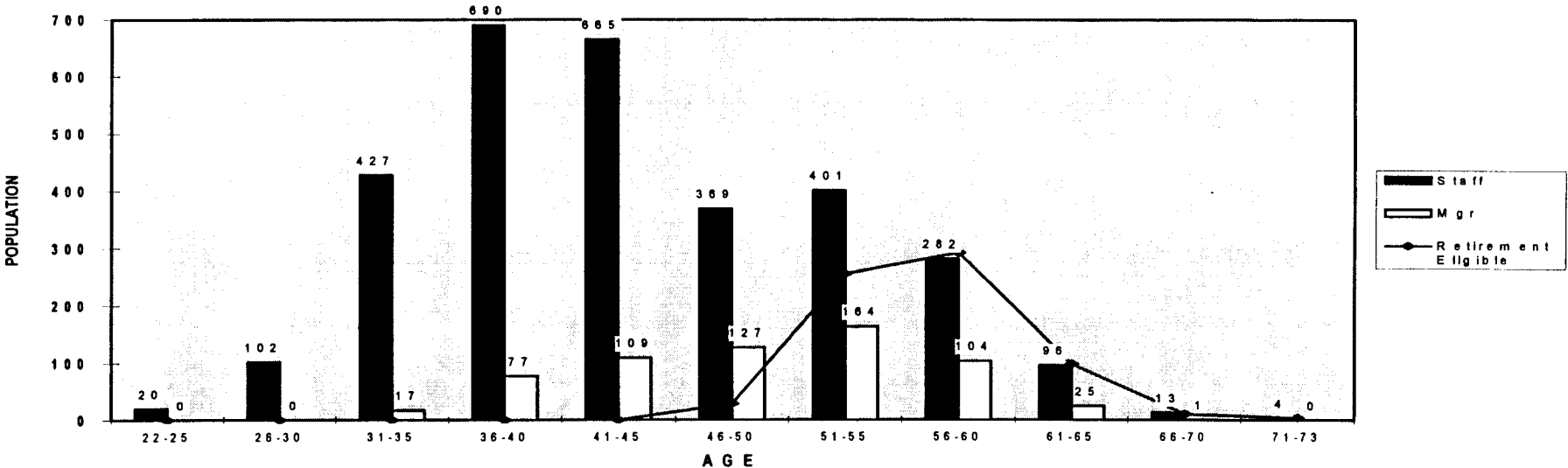
A generation of the most experienced is gone or leaving; the current generation has less experience and practice; the next generation has not been hired.

A-9

FY 90 - Technical Staff & Management



FY 97 - Technical Staff & Management

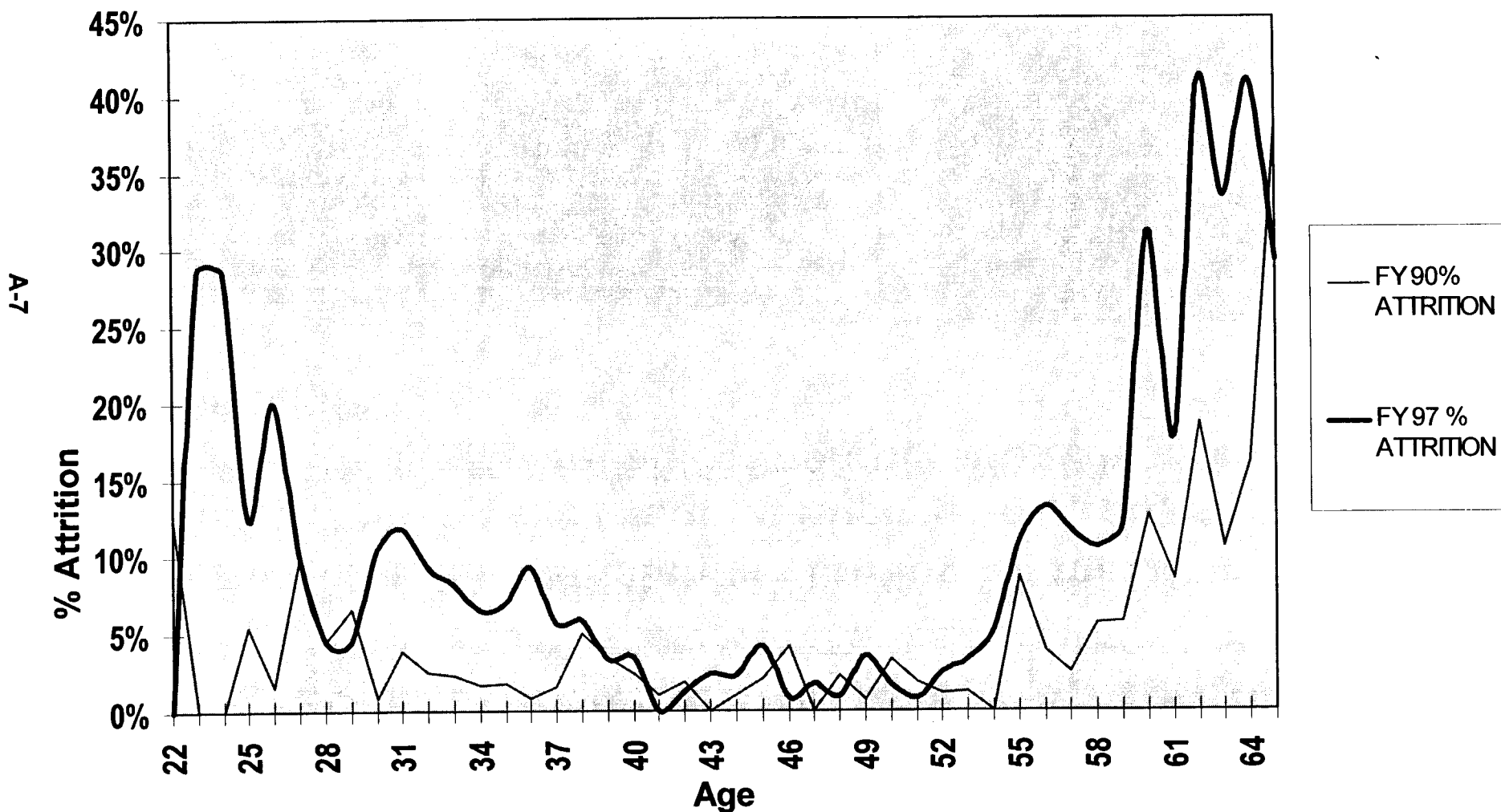




# Hiring & Retaining People Needs Attention

Fewer recent college graduates are being hired.  
People are leaving Sandia for other work opportunities.

FY90 & FY97 Attrition Rates

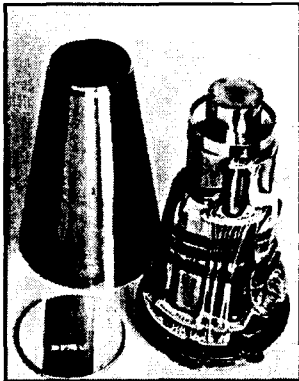


# Knowledge Management Program (*KMP*): People, Information/Data, Capabilities

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A program that withstands scrutiny for maintaining and advancing the required nuclear weapons expertise to ensure a safe, reliable, and operationally effective stockpile.

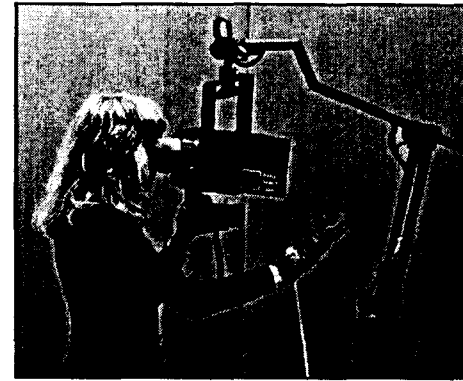
A-8



1945



1997



Future Weaponneers



# Vision

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■ **Engineers, scientists, and decision makers who maintain the nuclear deterrent demonstrably merit the nation's confidence. The advancement of their knowledge (through their successors, data and information, and capabilities) earns the continuing confidence of the nation.**

- **The people have the knowledge of the past and the skills and tools necessary to make and implement the decisions of the future.**
- **Key technical areas, which are critical to the weapons mission, are identified.**
- **These areas are analyzed by cognizant department and project managers for the expertise, information, and capabilities needed to meet current commitments and support the mission.**

A-9



# For Knowledge Management to be Successful

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- We must have challenging, enduring assignments on weapon products.
- The line, CIO & HR must be full partners in the program:
  - The secure network is critical.
  - Corporate Training, Library & Staffing are key players.
  - Line staff and managers’ buy-in is critical.
- Four elements are needed:
  - Managers & staff must focus on developing their successors--become a “learning organization.”
  - A Knowledge Management Process to discern knowledge needs.
  - A Nuclear Weapons Institute to support learning needs.
  - An Information Management Process for the data & information.

A-10



# POLICY STATEMENT

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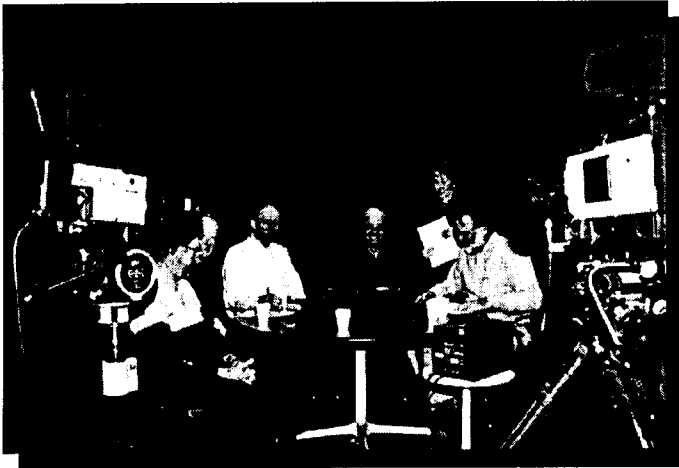
Every engineer, scientist, and decision maker must be demonstrably qualified to execute their responsibilities associated with maintaining the nuclear deterrent. They are expected to demonstrate individual initiative and invest in their own learning to continually improve their performance in the dynamic environment of nuclear weapons. It is essential that they maintain and advance the knowledge of the past as they encounter and use it in executing daily activities. They and their managers must further advance the knowledge by developing their successors, by maintaining data and information in a retrievable manner, and by maintaining the capabilities essential to the conduct of their responsibilities.

A-11

The weapons program leadership shall provide the opportunity for success through challenging work, adequate resources and tools, and educational alternatives. Skills and demographics will be managed so that backups for critical positions and losses because of transfer, retirement, or resignation do not impact any program. The leadership will make investment and disinvestment decisions based on integrated data on people, information, and capabilities. Success is measured by our individual and collective work results as reflected by the state-of-health of the stockpile and by the confidence our customers and the public express in us, now and in the future.



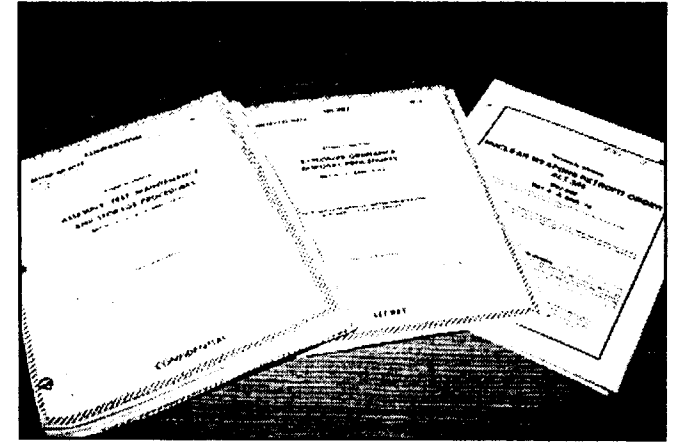
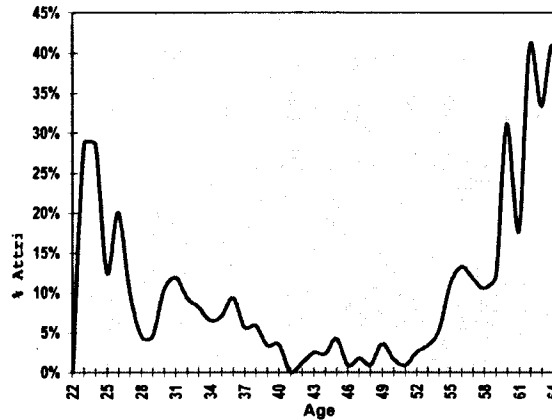
# Knowledge Management: Sustaining Capabilities



A-12

**Preserve the Past**

**EXPERTS**

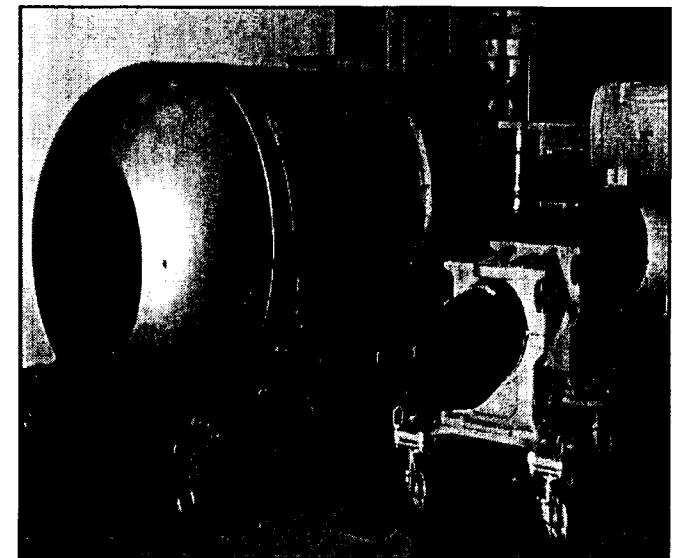


**Accessible Information**

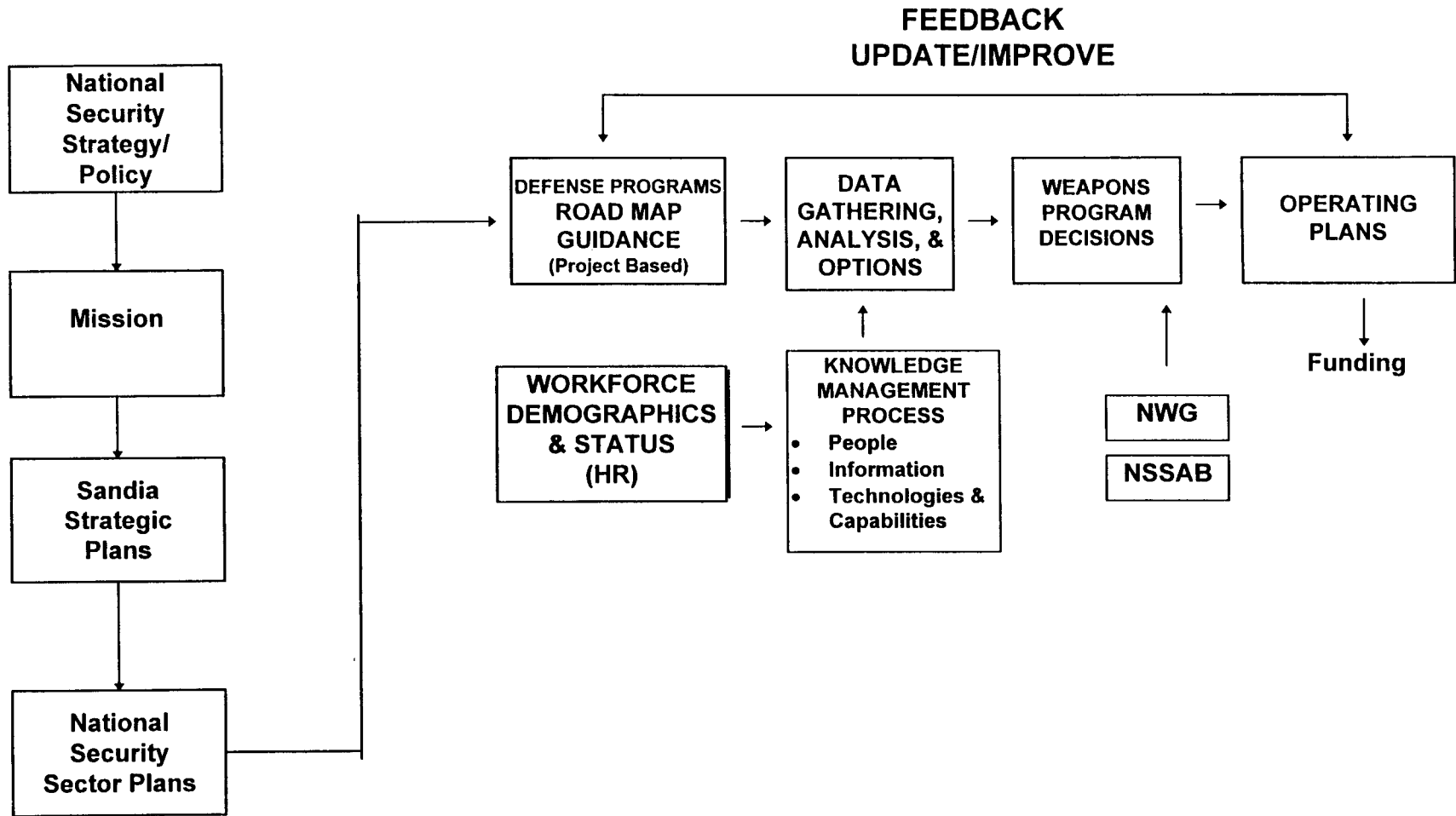
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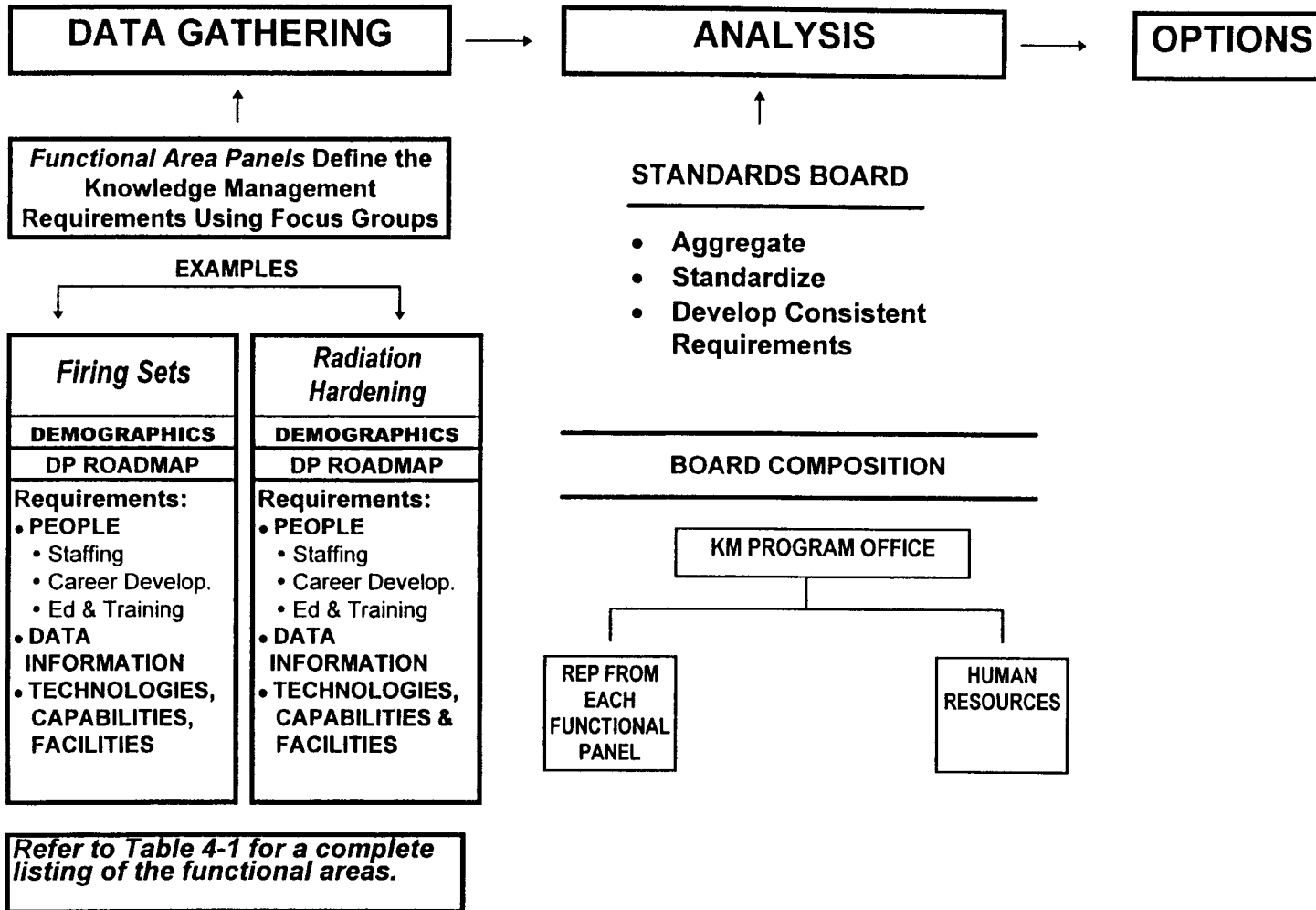
**SUCCESSORS**



A-13



**National Security Sector Decision Process  
Integrated with a Knowledge Management Program**



**KNOWLEDGE MANAGEMENT PROGRAM DATA GATHERINGS, ANALYSIS, AND OPTIONS**



# Tools: Nuclear Weapons Institute

---

- An orientation program provides a common starting point for baseline knowledge for all Sandia new hires.
- A one year (half time education and training) intern program teaches the stockpile to the next generation of weaponeers.
- Career development courses that “teach the stockpile.”
  - Heritage
  - Engineering Process
  - General Principles
  - Stockpile Systems & Subsystems
  - Technologies & Components
  - Surety

A-15



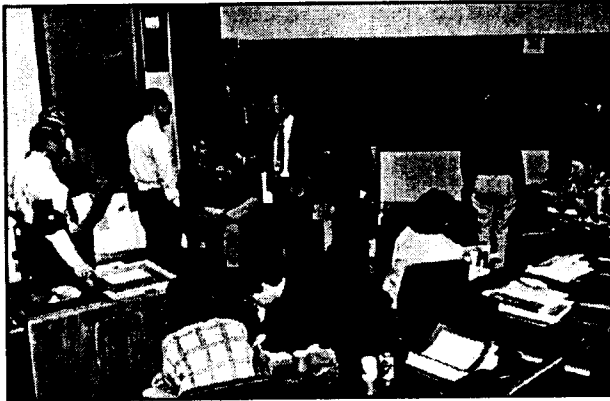
# Tools: Knowledge Management Process

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- Identifies major weapon functional areas and collects their knowledge needs.
  - Start October 1997; complete by January 2000
  - Update every two years.
- A Standards Board brings consistency across the functional areas and establishes priorities.
- A decision model aggregates expertise, information, and capabilities needs of each of Sandia's critical functional areas to provide options for critical budget, programmatic, staffing and investment decisions by August 1998.
- *The process merges all the good approaches that Sandia has employed over the years and provides a formal, consistent, and standardized corporate approach.*



# KMP: Preserving Knowledge



A-17

## ■ Video interviews with weapon experts

- Who: retired and on-roll engineers and scientists
- What: focus on weapon systems, technologies, components
- How many: 90 one-on-one interviews and panel discussions



## ■ Instant access via full-text search on digitized videotapes



# Knowledge Management Program

I HEAR  
AND I  
FORGET



EDUCATION

I SEE  
AND I  
REMEMBER



RECORDS

I DO  
AND I  
UNDERSTAND

*Confucius*



EXPERIENCE

Activities	FY 1998			FY 1999			FY 2000			FY 2001			FY 2002		
Plan & Policy Communicated	Δ														
Program Office	Δ														
Knowledge Management Process															
Functional Area Panels	Δ	Conduct Panels						Complete	Δ					Updates	Δ
Standards Board	Δ	Meet Quarterly to Review Data and Make Recommendations													
Decision Model	Δ	Develop				Inttlal Report	Δ			Annual Reports	Δ			Δ	
Nuclear Weapons Institute															
New Hire Orientation Class	Δ	Develop	Δ	Pilot	Δ		Δ	Δ		Δ		Δ		Δ	
Intern Program		Develop	Pilot	Δ		Δ		Δ		Δ		Δ		Δ	
Career Development Training	Δ	Develop							Aperiodic Classes to Meet Demand						
Retiree Seminar		Δ	Pilot			Δ	Expand		Δ	Annual Seminar		Δ			
Facility Upgrade				Δ											Δ
Information Management Process															
Standards		Δ													
Legacy Data Conversion	Δ	Develop		Δ	Pilot	Δ			Continuing Process						
Classified Infrastructure			Δ												
Search and Access Tool			Δ												
Automated Metadata Creation				Δ											
Knowledge Preservation	Continue Current Projects														
Developing People															
Qualification Program		Δ	Develop				Δ	Required		Continuing Process					
Certification Program							Δ	Develop		Δ	Required	Continuing Process			
Mentoring Process		Δ	Develop				Δ	Implement		Continuing Process					
Rewards & Recognition Program							Δ	Develop		Δ	Implement				
Succession Planning Program		Δ	Develop				Δ	Implement		Continuing Process					
Retiree Augmentation Database	Δ	Develop	Δ		Annual Seminars in NWI (above)										
Automated Demographics	Δ	Analysis	Δ	Report				Δ	Annual Reports		Δ			Δ	
Staffing Planning			Δ					Continuing Process							Δ

**Table 6-1. Knowledge Management Program (KMP) Summary Tasks and Budget (\$K) In FY98 Dollars**

ACTIVITY	FY98	FY99	FY00	FY01	FY02
<b>Plan and Policy Communicated*</b>	25	*	*	*	*
<b>Knowledge Management Process</b>					
Functional Area Panels Facilitation	50	50	25	25	25
Standards Board	50	50	50	50	50
Computerized Decision Model	200	200	50	50	50
<b>Subtotal</b>	<b>325</b>	<b>300</b>	<b>125</b>	<b>125</b>	<b>125</b>
<b>Nuclear Weapons Institute (NWI)</b>					
KMP Manager	250	250	100	0	0
KMP Administrative Support	100	100	50	0	0
NWI Senior Engineer	300	300	300	300	300
Nuclear Weapons Institute Administration	250	250	250	250	250
New Hire Orientation Class	60	25	25	25	25
Intern Program Curriculum and Class	200	400	300	300	300
Career Development Classes	50	700	600	600	600
Retiree Seminar/Pay Retirees	60	25	25	25	25
<b>Subtotal</b>	<b>1270</b>	<b>2050</b>	<b>1650</b>	<b>1500</b>	<b>1500</b>
<b>Information Management Process</b>					
Nuclear Weapons Info Group Support	25	25	25	25	25
Knowledge Preservation Project	1200	1200	1200	1200	1200
Library History Project	75	75	75	0	0
Pilot Nonelectronic Data Conversion*	300	200	*	*	*
Classified Infrastructure*	100	*	*	*	*
<b>Subtotal</b>	<b>1700</b>	<b>1500</b>	<b>1300</b>	<b>1225</b>	<b>1225</b>
<b>Succession Development Process</b>					
Individual Development Plan Template*	100	*	*	*	*
Qualification Standards Definition*	100	*	*	*	*
Certification Standards Definition*	0	150	*	*	*
Automated Demographics*	50	*	*	*	*
Staffing Planning*	25	*	*	*	*
Rewards and Recognition Process*	25	*	*	*	*
Rewards for Qualification/Certification†	†	†	†	†	†
Succession Planning*	25	*	*	*	*
Retiree Augmentation Database*	30	*	*	*	*
<b>Subtotal</b>	<b>355</b>	<b>150</b>	<b>*</b>	<b>*</b>	<b>*</b>
<b>TOTAL KMP BUDGET</b>	<b>3650</b>	<b>4000</b>	<b>3075</b>	<b>2850</b>	<b>2850</b>
<b>Related Projects</b>					
Standards*	450	*	*	*	*
Search and Access Tool*	750	500	*	*	*
Automated Data Creation*	500	250	*	*	*
Interns (50 per year at 0.5 FTE)	0	2500	5000	5000	5000
NWI Facility Upgrade‡	250†	250†	150†	2000†	7500†
<b>TOTAL RELATED PROJECTS BUDGET</b>	<b>1950</b>	<b>3500</b>	<b>5150</b>	<b>7000</b>	<b>12500</b>
<p>* One-time start-up costs; maintenance assumed to be cost of doing business.</p> <p>† Not estimated; reallocation of existing funds.</p> <p>‡ Preconceptual cost estimate (revitalize Bldg. 892), draft, justification for critical decision 1, NWI, December 1996, page 4d-6. Architectural Research Consultants, Inc. NSS decision forthcoming on either capital or expense-funded project. If capital dollars funded, project start is FY01; project end is FY04; FY03 funding at \$13.5M, FY04 funding at \$7M. Total estimated cost is \$30M. FY98-FY00 budget (\$650K) for CDR and validation process.</p>					

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