

# SAND REPORT

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## **Green Zia Application Sandia National Laboratories' Neutron Generator Production Facility**

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**Abstract**

The Green Zia Environmental Excellence Program is a voluntary program designed to support and assist all New Mexico businesses to achieve environmental excellence through continuous improvement and effective energy management. The program encourages integration of environmental excellence into business operations and management practices through the establishment of a prevention-based environmental management system. The Neutron Generator Production Facility has participated in the Green Zia Environmental Excellence Program for two years. This document is the submittal application for inclusion in the 2003 Green Zia program year.

## **Acknowledgements**

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**Green Zia Environmental Excellence Program:**  
*Assuring a healthy environment and a healthy economy  
for New Mexico*

**Green Zia Program Application Cover Form**

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**Level of award you are applying for:**

- **Achievement Recognition Level – Neutron Generator Facility**  
**Sandia Document Number: SAND2003-0841**

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# Sandia National Laboratories Neutron Generator Production Facility

## **BUSINESS OVERVIEW**

### Corporate Framework

Sandia National Laboratories'/New Mexico (SNL's/NM) Neutron Generator Production Facility (NGPF), Department 14400, mission is to build neutron generators, to meet the nation's deterrence strategy. SNL/NM is a multi-program engineering and science laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the US Department of Energy/National Nuclear Security Administration (DOE/NNSA). SNL/NM designs all non-nuclear components for the nation's nuclear weapons, performs a wide variety of energy research and development projects, and works on assignments that respond to national security threats — both military and economic. SNL/NM is located on the south side of Albuquerque, NM.

As in any government agency, the ultimate funding source for SNL/NM operations is the US Congress. DOE/NNSA is the body that actually manages congressional allocations, supplying money to SNL/NM through contractual agreements. Sandia Corporation then creates budgets and plans to carry out its national security mission based on DOE/NNSA directives and its own operating experience. Part of SNL/NM's mission is to build and test neutron generators. Neutron Generators are miniature particle accelerators. The NGPF is operated to help carry out this aspect of the mission of SNL/NM.

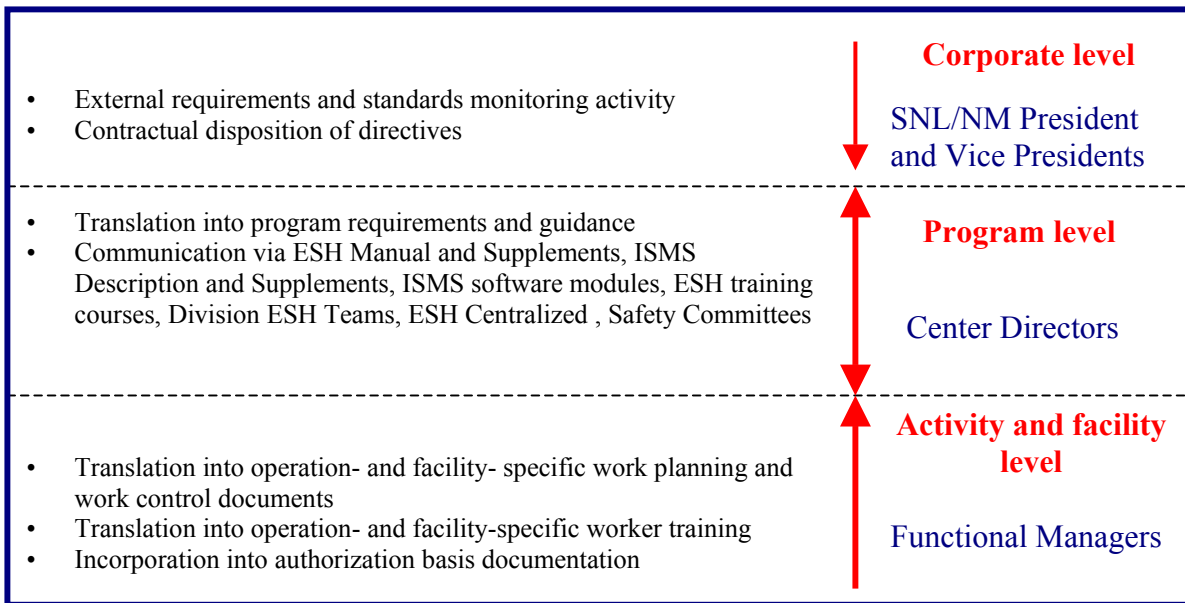
### Corporate Management Structure and Requirement Flow-down

To make a distinction between Baseline requirements that the NGPF is required to implement and Excellence, it is necessary to explain SNL/NM's management structure and how requirements flow down to the department levels. The management structure of SNL/NM starts at the Laboratory Director, Deputy Director, and Executive Vice President level. A Vice President oversees the next level of SNL management called Divisions. Below them, are Directors who oversee what are known as Centers. Centers are broken up into Departments that are overseen by Level II and Level I Managers. Team Supervisors may oversee teams within departments. The manager of the NGPF is the Director for organization 14400.

The NGPF (14400) is located within the Manufacturing Systems, Science and Technology Division (14000). At SNL/NM, Division 14000 has the responsibility for all manufacturing activities.

Operational requirements provided by DOE/NNSA to SNL/NM are listed in a prime contract between the two entities. This contract spells out the requirements and expectations for operational management at SNL/NM. Sections of this document “flow-down” requirements for certain functional areas including the NGPF. In this application, any requirement that is flowed down to the NGPF is considered a Baseline requirement. Any additional measures that the NGPF has made to reach above what is required of them in the prime contract are considered Excellence.

To consistently implement requirements across the laboratory there is a set of Corporate Process Requirements (CPRs) which are high-level policy documents that establish corporate requirements for certain functions. SNL/NM's senior management assigns responsibilities for the contents of CPRs to functional managers, the manager of the NGPF is a functional manager. The functional manager(s) is responsible for interpreting the requirement and writing a process requirement document that sets the corporate compliance perspective for their area of responsibility. A functional manager(s) is also responsible for implementing other applicable CPRs into their operations. The manager of the NGPF is responsible corporately for the operation of the production of neutron generators. Figure 1 is a schematic representation of how information flows from SNL/NM upper management to the department level.



**Figure 1: SNL/NM Information and Requirement Flow Down**

All requirements that the NGPF is mandated to follow flow down in the general manner depicted in Figure 1. Specific ES&H minimum requirements are defined in the SNL/NM Environment Safety and Health (ES&H) Manual. The ES&H Manual is a corporate document in which information flows both ways. This is due to the coordinated effort between corporate ES&H personnel and department representatives in writing the requirements in the ES&H Manual. The requirements in the ES&H Manual are defined and passed to organizations through the Corporate Integrated Safety Management System (ISMS). ISMS has five basic steps associated with it 1) Define the scope of work 2) Identify and analyze hazards associated with the work 3) Develop and implement hazard controls 4) Perform work within controls 5) Provide feedback on adequacy of controls and continue to improve safety management.

Center and Department level personnel within the NGPF have specific tools and resources available to them through the ISMS system that include: the ISMS Software, ES&H Training, and Division ES&H Teams, to meet the corporate requirements set forth in the ES&H manual. In addition to the corporate resources, the NGPF is unique at SNL/NM by sponsoring its own internal ES&H personnel that interact with the

corporately provided resources. These resources not only aid the NGPF in meeting their Baseline corporate requirements they also are utilized in NGPF sponsored activities. This allows ES&H Professionals to go beyond Baseline requirements and work with the NGPF to design and build to the Excellence level every time. Figure 2 is a depiction of how ES&H requirements flow from external sources to the SNL/NM department level.

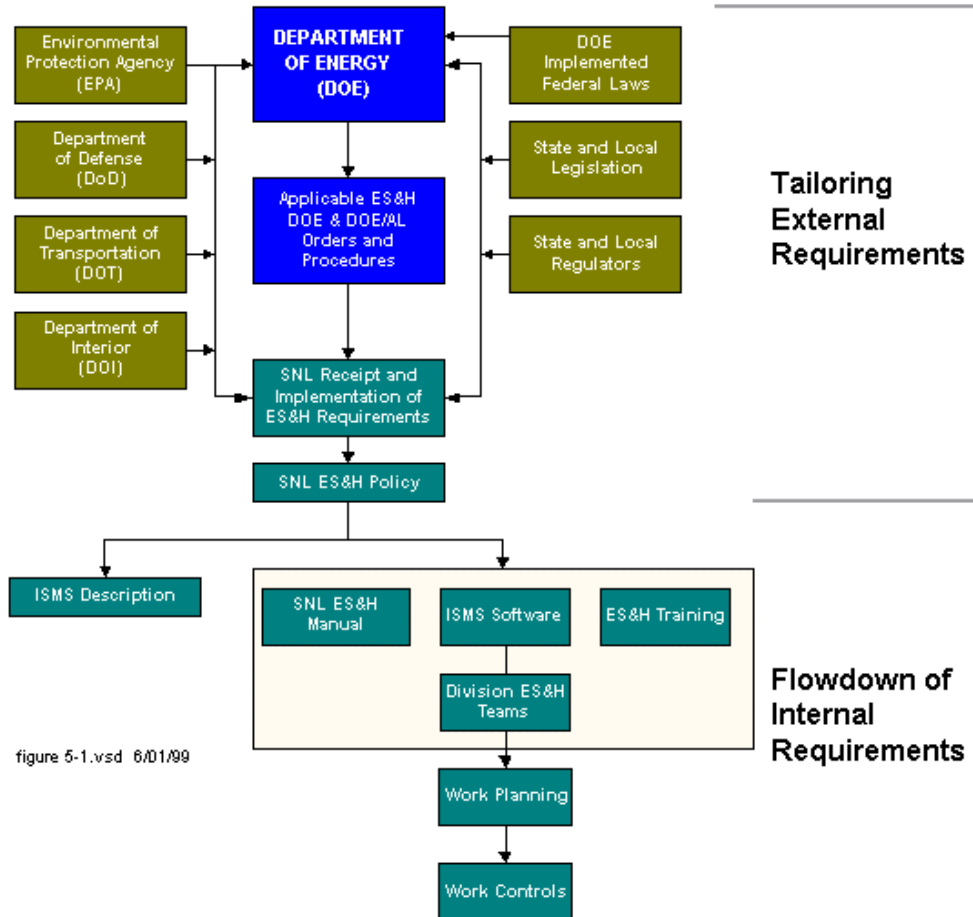


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**Figure 2: ES&H Requirement Flow Down**

**NGPF's Structure**

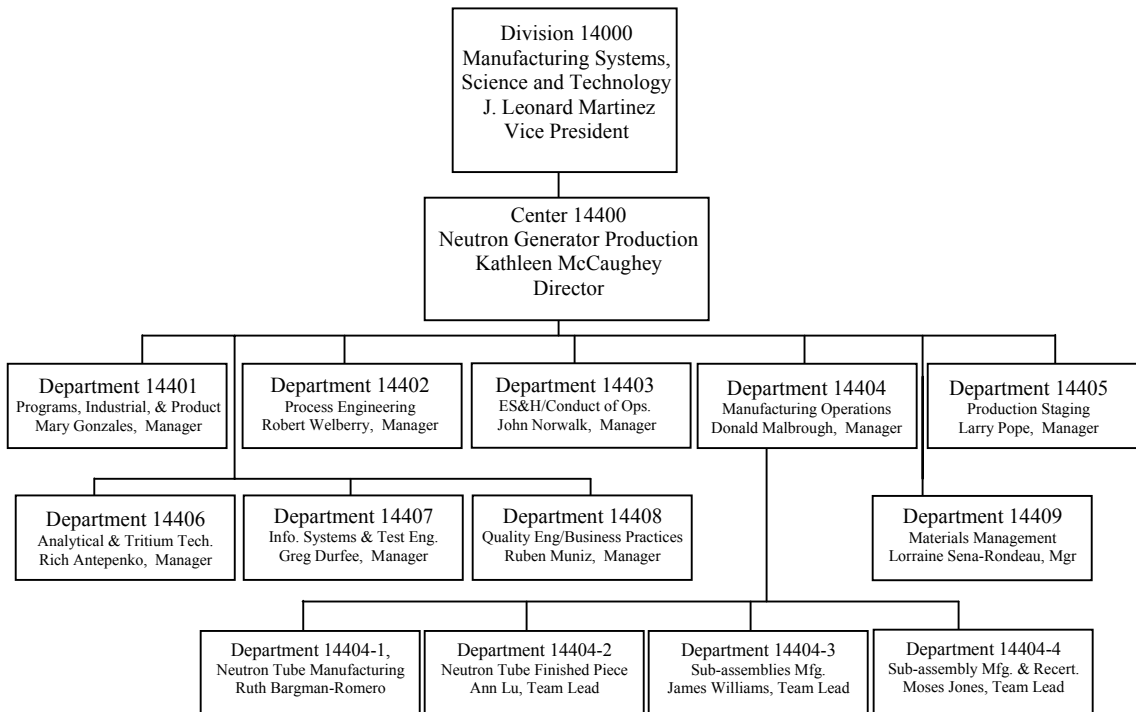
The management structure of the NGPF is composed of 1 Center Director, 10 Department Managers, and approximately 275 employees. The Director of the NGPF reports directly to the Division 14000 Vice-President. Corporate requirements that are pertinent to the NGPF would flow down from the Vice President of Manufacturing Systems, Science and Technology Division to the NGPF's Director. The NGPF's Director would then assign responsibility to the appropriate department manager.

The employee structure of the NGPF is comprised of approximately 250 individuals with education levels ranging from high school to doctorate level educations.

Employees within the NGPF are divided into 9 departments. The department managers are responsible for upward communication of information from the employees to management for all activities including Environmental, Health, and Safety (ES&H) concerns. Figure 3 displays the organizational structure of the NGPF. Department 14403 is responsible for ES&H, security and Formality of Operations support to Center 14400.



This support includes: direction of the Integrated Safety Management System (ISMS), implementation within Center 14400 of regulatory interpretation of EPA, OSHA, DOE/NNSA, and SNL/NM standards and technical guidance on issues which include industrial hygiene (chemical and non-ionizing radiation control), ionizing radiation, safety (electrical, explosives, and mechanical), waste management, pollution prevention, and conduct of operations. Department 14403 is composed of an integrated team of professionals from both 14000 and 3100, all of whom reside in Building 870. The Customer-Supplier relationship between 14400 and 3100 will be described in Category 3.



**Figure 3: Neutron Generator Facility Organization Chart**

**Location, Facilities, and Equipment**

NPGF is one of the most advanced production facilities of its type in the United States. The NGPF consists of Buildings 870, 857, and 905 at Sandia National Laboratories/New Mexico (SNL/NM). The NGPF was moved from the DOE Pinellas Plant in Florida to SNL/NM in 1995. The NGPF is currently in its 5th year of operation out of a 25-year facility life.

The NGPF is a non-reactor, non-nuclear facility comprised of about 100,000 square feet. The facility has both radiological and non-radiological areas. The NGPF limits all radiological work to the "Tritium Envelope," a radiological controlled area within Building 870. The purpose of the Tritium Envelope is to limit the possibility of tritium contamination throughout the facility. The Tritium Envelope has self-contained water and air emissions capture systems to prevent tritium releases to the environment.

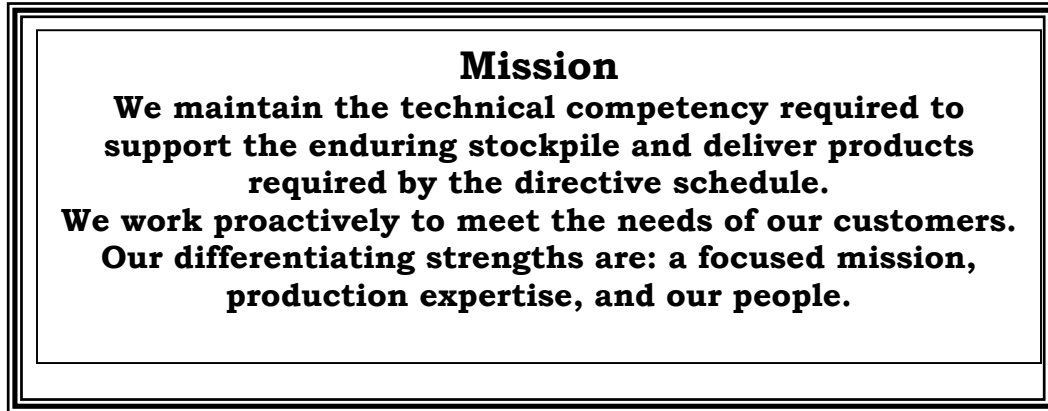
Neutron generators have unique production complexities due to stringent performance requirements, complex physics and processes, and the need for extensive prototyping and testing. Changes to the production process undergo a rigorous review and approval

process. Due to the rigor of the review and approval process, a strong environmental management system is needed to ensure continuous improvement.

**Purpose, Vision, Mission and Values**

The purpose of the NGPF is to provide a product, neutron generators, to our customers.

The mission (figure 4) that the NGPF has set for itself is to provide service with excellence in cost effectiveness, safety, environmental awareness and efficiency.



**Figure 4: Mission**

**Customers, Suppliers, Partners, and Stakeholders**

This section defines many working relationships of the NGPF. Figure 5 depicts those relationships.

<b>Customers</b>	<b>Suppliers</b>	<b>Partners</b>	<b>Stakeholders</b>
DOE/NNSA	Off-Site Vendors Container suppliers	SNL/NM Procurement	Local Community
SNL/NM Corporation	SNL/NM Customer Pollution Prevention Support Teams (Center 3100) Design Teams (Center 2000)	SNL/NM	Regulators City State Tribal Government
	Waste Management Disposal Facilities Transportation Companies Recyclers Blenders and bulking operations		SNL/NM Community: Employee's and Their Families

**Figure 5: Relationship Matrix**

**Customers** are defined as those organizations or entities that are in some way responsible for funding of or receive a service from the NGPF. Customers include: DOE/NNSA and SNL/NM. The relationship with and requirements of DOE/NNSA and SNL/NM are defined in the corporate framework section of this organizational overview. The NGPF is required to meet all of the ES&H requirements in the ES&H manual.

**Suppliers** are defined as organizations or entities to which the NGPF pays money. These suppliers include off-site vendors, Center 3100 SNL/NM Customer Support teams, SNL/NM Pollution Prevention, Division ES&H Coordinator, and SNL/NM Waste Management.

The NGPF works closely with its suppliers. The NGPF's prime concern is to reduce physical and chemical hazards to its employees and customers as well as to consider the environmental implications of its purchases.

**Partners** are defined as organizations or entities that work together with the NGPF for their mutual benefit with no actual financial considerations taking place. Partners include SNL/NM Procurement and Property Reapplication.

**Stakeholders** are defined as organizations or entities that have an interest in or are affected by the actions of the NGPF but do not fall into the other categories. The major stakeholders are the local community, regulators, and the SNL/NM community.

**Environment, Safety and Health Aspects**

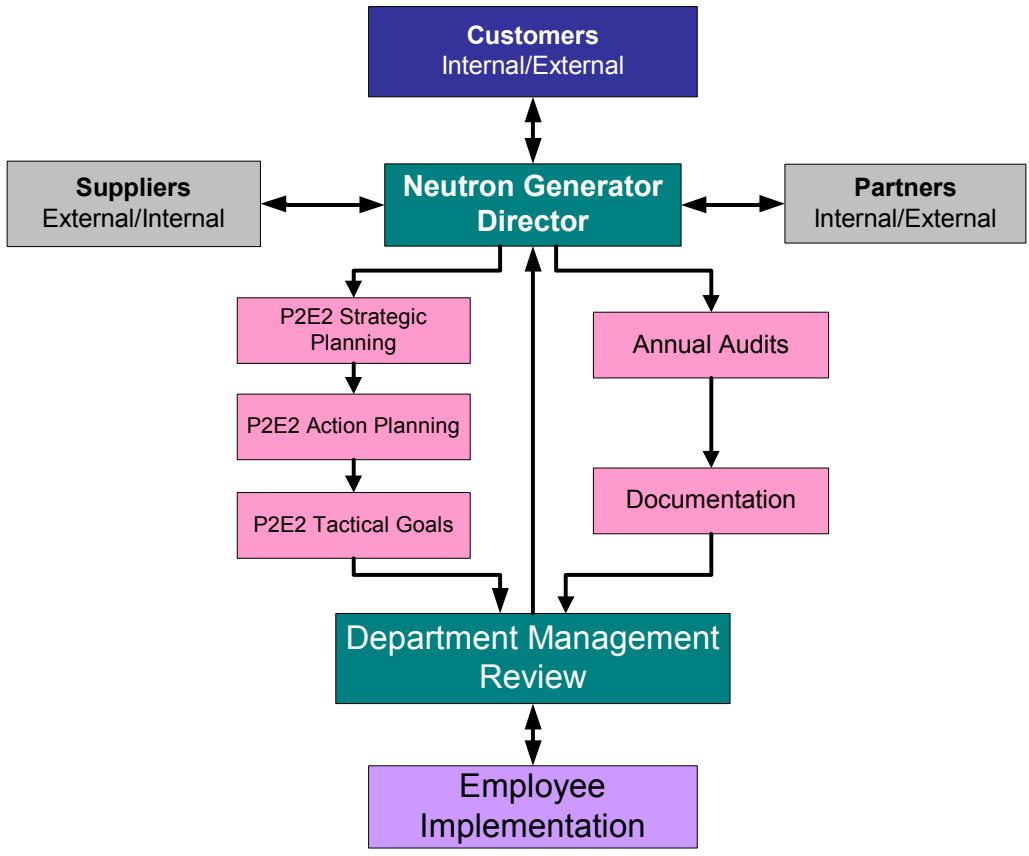
ES&H ideas and understanding are integrated into the way NGPF does business. NGPF has determined that the main impacts of their operations on employee safety and the environment are depicted in Figure 6.

Physical Hazards	Chemical Hazards	Hazardous Waste	Solid Waste	Radiological
Repetitive Motion	Solvents	Outdated chemicals	Outdated chemicals	Employee Exposure
Physical Stresses	Cleaning Chemicals	Used Chemicals	Outdated equipment	Release to the environment
Contact with hazards from machinery	Acid/Bases	Spill Clean-up	Broken equipment	Contamination

**Figure 6: Main ES&H Impacts of NGPF**

**Environmental Management System**

The NGPF's environmental management system is integrated in its total management system. Through training and management commitment efforts the NGPF regularly considers safety and environment as part of daily operations. Figure 7 is a depiction of NGPF's current environmental management system.



**Figure 7: NGPF's Environmental Management System**

**Strategic Context**

The NGPF is in the 6<sup>th</sup> year of a 25-year facility life. Production at the facility is not at full capacity and is still in the process of “ramping up”. This affects the production of physical wastes and use of resources. NGPF ES&H professionals and management are working very hard to reduce where possible all wastes that the facility produces, but since the facility is not at full capacity the waste streams will continue to increase.

**Competitive Environment**

Because NGPF is part of a government-managed contract, traditional competition is not a factor. Although NGPF is the only facility of its kind in the nation, it has started to take steps to benchmark a number of private and other government facilities to identify best practices that would consider safety, health and environment as well as efficiency.

## Category 1: Leadership

***How is your organization's senior leaders' vision and commitment to continuous environmental improvement demonstrated to employees, suppliers, customers, oversight agencies, and other interested parties through management involvement, strategic plans, alignment of resources, performance measures, and management review?***

The management structure of the NGPF is composed of 1 Center Director, 9 Department Managers, 8 Team Leaders and approximately 250 support staff. The Director of the NGPF reports directly to the Division 14000 Vice-President. Operational requirements provided by DOE/NNSA to SNL/NM are listed in the Prime Contract between the two entities. This contract spells out the requirements and expectations for operational management at the Laboratory. Sections of this document “flow-down” the requirements for certain functional areas including NGPF Management.

The NGPF Center Director is responsible for all aspects of the operations at the NGPF including environmental improvement. The 14403 Department Manager establishes ES&H specific policies, procedures and training for the NGPF that meet the flowed-down SNL/NM Prime Contract requirements. The 14403 Department Manager is at the same level as the other department managers, ensuring that ES&H is given equal emphasis with production.

The NGPF Center Director provides a strategic objective that is incorporated into a more inclusive strategic plan and this plan addresses additional areas for improvement of ES&H at the NGPF. Site-wide environmental related performance measures are tracked and reported to upper management on a quarterly basis. Site-wide environmental performance measures related to the NGPF include:

- Purchase environmentally preferable products and that meet our mission needs; and increase the use of low-polluting chemicals, including bio-based products
- Reduce waste from routine operations by 90% or hazardous waste by 2005, based on 1993 baseline.
- Recycle 45% of sanitary waste from all operations by 2005 and 80% by 2010, based on a 1993 baseline.
- Reduce sanitary waste from routine operations by 75% by 2005, and 80% by 2010, based on a 1993 baseline.
- Reduce energy consumption by 20% by 2005 and 30% by 2010, based on a 1990 baseline.
- Reduce low-level and mixed radiological waste from routine operations by 20% by 2005, based in 1993 baseline.

Specific ES&H minimum requirements are defined in The SNL/NM Environment Safety and Health (ES&H) Manual. To ensure that ES&H matters are incorporated into all facets of operations, NGPF management has coordinated the availability of six Center ES&H specialists and a part-time pollution prevention specialist to directly support environmental related activities. These ES&H and pollution prevention specialists serve the entire Center and work actively with all personnel in the Center. The ES&H

## **GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA**

specialists report directly to the 14403 manager who oversees environmental activities for the NGPF. The ES&H specialists act as a liaison between NGPF line management, line employees, and SNL's environmental technical support groups to ensure environmental management is being communicated and carried out in an effective manner.

NGPF has embraced the philosophy contained in the Green Zia Environmental Excellence Program. All members of the department are aware of the program and actively participate in process improvements both through formal mechanisms and through informal communication with NGPF's senior leadership. See Category 2: "Planning for Continuous Environmental Improvement," Category 4: "Information And Analysis, and Category 5 "Employee Involvement" for further information how NGPF's management has supported and actively participated in improvement processes. Additionally through the submissions of 2002 and 2003 Green Zia applications, NGPF's Center Manager is reinforcing the importance of Pollution Prevention (P2) and environmental excellence.

***How does your organization support environmental issues and activities in the community and how does it communicate and demonstrate its continuous environmental improvement goals and performance to the community?***

NGPF's management follows SNL policy of encouraging employee involvement in the community where possible. The NGPF is a weapon's component facility and due to the sensitivity of this work, direct community involvement is not always feasible or practical.

The Center Director does however support NGPF community participation through SNL's Community Involvement and Issues Management Department. SNL's Community Involvement and Issues Management Department is responsible for coordinating all of SNL's community outreach projects. SNL's community outreach includes partnerships with educational groups and community leadership organizations, partnerships with small disadvantaged businesses, The National Atomic Museum Outreach, encouraging environmental responsibility, and by positively influencing Albuquerque's economy. The NGPF Center Director has directed a couple of members of the NGPF staff to coordinate all community outreach activities. In FY02 NGPF as an organization participated in three activities. Past activities have included a weekend project building for Habitat for Humanity, United Way programs, and assisting Albuquerque Public Schools to help clean-up school grounds.

The Center Director is 100% committed to support the participation in the Green Zia program and has allocated time and resources to implement this program. Once a year during a Center 14400 "All-Hands" meeting, ES&H specialists have an opportunity to discuss the progress of the Green Zia program as well as "Success Stories" of environmental excellence with the entire population of the NGPF. The participation in the Green Zia Program has also provided a positive source of community interaction with local businesses and other SNL organizations participating in the program.

**Category 2: Planning for Continuous Environmental Improvement**

***How does your organization use its prevention-based environmental management system to help set its long-term direction for environmental improvement?***

NGPF's overall business objective is to provide Sandia and DOE/NNSA with neutron generators in a safe, cost effective manner. Through many of the pollution prevention projects that NGPF has initiated over the years the economic value of working towards environmental excellence has been seen, as well as improved safety and worker health. The mission that the NGPF has set for itself is to provide service with excellence in cost effectiveness, safety, environmental awareness and efficiency. Pollution Prevention Opportunity Assessments (PPOA), and implemented Pollution Prevention projects support this mission while helping the NGPF to strive towards environmental excellence.

NGPF has 6 specific values that are linked to their business objective and they are:

**Preface**

I will lead by example, demonstrating our values and behaviors. I recognize, foster, and support shared values and common focus across the Division and the Corporation.

**Integrity**

I will practice consistency and objectivity in my evaluations, assessments, issue resolution, and decision-making. I will demonstrate principle-centered behavior based on justice, fairness, and dignity. I am responsible and accountable for my personal safety and promoting a safe workplace for others and the protection of our environment.

**Excellence**

I will base evaluations and conclusions on data. I will practice and encourage critical thinking, creativity and innovation. I will provide and accept challenging work assignments and seek to enhance our capabilities, skill levels and facilities to achieve individual and institutional growth.

**Service to the Nation**

I will base decisions on what is in the best interest of the customer and demonstrate a passion for their success. We develop and deliver manufacturing science and technological expertise, products, and services that meet or exceed the needs of our customers in support of national security.

**Each Other**

I recognize and appreciate the diversity among individuals and classifications, and treat everyone with dignity and fairness. I will foster an environment where asking each other for help will continue to leverage our collective skills and grow our ever-expanding network within the boundaries of national security. I will balance the need for mission success and personal, family, and community responsibilities and respect others' personal choices.

**Teamwork**

I encourage, participate in, and lead teams. I recognize my success depends on our success; therefore, I place our mutual benefit above solely personal success.

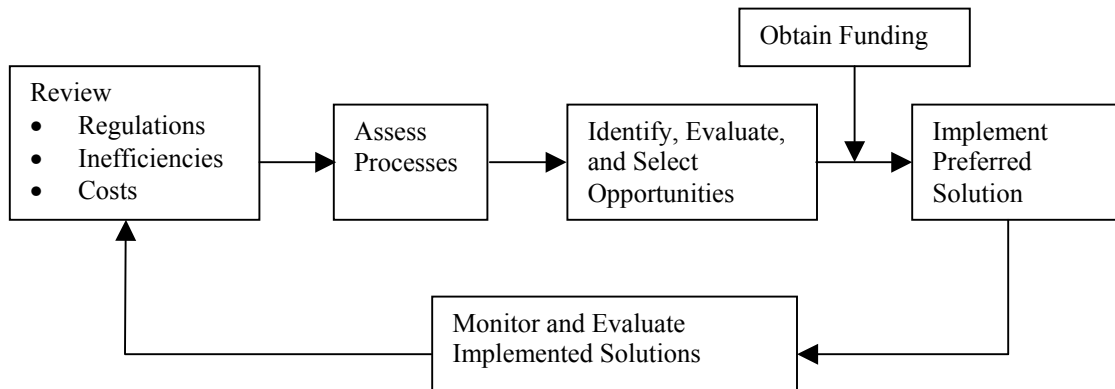
## GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA

Through NGPF's Values environmental excellence has become a business objective and relates to the overall business by lowering NGPF's operating costs and supporting a safe working environment.

The NGPF uses their business objective and values as a foundation for long-term planning. NGPF participates in the SNL/NM Performance Appraisal process by performing Appraisals and Self-Assessments against specific performance evaluation criteria negotiated with DOE/NNSA at the beginning of each fiscal year. These criteria typically relate to areas of special interest to DOE/NNSA. The annual self-assessment processes cover all areas of the operation of the NGPF. They are used to develop the Strategic Plan and to find weaknesses in other areas. The Strategic Plan is a NGPF specific document that contains annual goals for all the departments. The Strategic Plan is a management lead document that integrates employee participation into all levels of successful production operations.

### **How does your organization develop short-term plans for specific continuous environmental improvement activities?**

Short-term plans for specific environmental improvement activities are developed through three methods. The first is during the annual self-assessment, which was described above. The second is the Pollution Prevention Opportunity Assessment (PPOA). Figure 8 represents the feedback system for continuous environmental improvement utilizing the PPOA methodology.



**Figure 8. Identification and Implementation of Projects for Continuous Environmental Improvement**

Team members of the assessment team include both members from NGPF and Pollution Prevention Specialists from one of NGPF's SNL/NM partner organizations: the Solid/Hazardous Waste Management and Pollution Prevention Department (3124). Further information regarding this partnership is in Category 3: "Customer, Supplier and Others Involvement." Members of the PPOA team are chosen based on their area of expertise, with each stage of production being represented as well as ES&H professionals and management. After an assessment is completed, the options generated from the PPOA will be further evaluated by the NGPF to determine which options can be funded



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out of the operational budget and which options will require additional funding from an outside source.

The third method that short-term plans are generated from is through 14400's Green Zia team, which monitors continuous improvement progress of both administrative and technical projects. The Green Zia team meets on a bi-monthly basis to ensure constant communication between the team members. Team members currently consist of waste management, process engineering, and pollution prevention personnel. The team will be working to expand membership to include industrial hygiene, safety, and floor personnel in FY03 and FY04.

***How are your organization's action plans implemented and integrated with its long-term direction?***

Action plans are generated during both the strategic planning stage and during short-term planning. All of the NGPF's action plans have ES&H integrated into them from the onset, whether or not they are related to environmental improvement initiatives. The success of NGPF's action plans is tracked in a number of ways. Action plans are reviewed before any equipment is purchased, when equipment is delivered and when equipment is being set-up and started. Monitoring and evaluation of the effectiveness of the action plans occurs through one of the following mechanisms:

1. Employee Communication: NGPF personnel communicate with their NGPF managers to provide feedback on the effectiveness of the implemented option. See Category 5: "Employee Involvement" for detailed information on the feedback process.
2. Quarterly Reporting: Quarterly waste generation and affirmative procurement reports are used to continuously monitor the effect of improvements in NGPF's waste minimization program. Results of the quarterly reports are discussed in the Green Zia team meetings.
3. The annual self-assessment: The self-assessment is used to assess progress in meeting the long-term goals and to evaluate opportunities for improvement in short-term planning. Results of the annual self-assessment are used to revise the Strategic Plan.

**Category 3: Customer, Supplier And Others Involvement**

Category 3 defines many working relationships of the NGPF. Figure 9 depicts those relationships that are most important to NGPF's environmental management system.

**GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA**

<b>Customers</b>	<b>Suppliers</b>	<b>Partners</b>	<b>Stakeholders</b>
DOE/NNSA	Off-Site Vendors	SNL/NM Procurement	Local Community
SNL/NM Corporation	SNL/NM Customer Support Teams (Center 3100) Design Teams (Center 2000)	SNL/NM	Regulators City State Government
	SNL/NM Waste Management Pollution Prevention		SNL/NM Community: Employee's and Their Families

**Figure 9: Relationship Matrix**

***How does your organization communicate its efforts to improve the environmental performance of a product, process, or service to its customers? Also, how does your organization involve its customers and seek customer feedback to improve performance and quality standards of products, production processes, and services within the context of continuous environmental improvement? Also how does your organization identify potential new customers through marketing strategies for "green" products and secondary markets for waste materials?***

**Customers** are defined as those organizations or entities that are in some way responsible for funding of or receive a service from the NGPF.

NGPF identified two primary customers:

- Sandia Corporation: Sandia Corporation, the governing corporation responsible for the management of SNL/NM has specific environmental Performance Measures that the NGPF contributes to. Performance Measures specific to and that the NGPF affects were discussed in Category 1. NGPF utilizes their continuous improvement approach to meet these Performance Measures. For example, one of the performance measures that the NGPF contributes to is purchasing environmentally preferable products. NGPF to help SNL/NM meet this performance measure has increased their use of bio-based cleaning solvents (See Category 7).
- Department of Energy: NGPF’s objective is to provide DOE/NNSA with neutron generators in a safe, cost-effective manner. To meet the goal of cost effectiveness NGPF has initiated several waste reduction/elimination initiatives and quality improvement through the Sigma 6 methodology.

***How does your organization involve its vendors and suppliers to improve performance and quality standards of products, production processes, and services within the context of continuous environmental improvement?***

**Suppliers** are defined as organizations or entities to which NGPF pays money. These suppliers include off-site vendors, SNL/NM Customer Support Teams, SNL/NM Waste Management, and SNL/NM Pollution Prevention.

## ***GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA***

- SNL/NM Waste Management: Sandia National Laboratories, NM had three different Waste Management Facilities that are utilized almost daily by operations at the NGPF: The Hazardous Waste Management Facility (HWMF), Solid Waste Transfer Station (SWTF), and the Radioactive and Mixed Waste Management Facility (RMWMF). Waste is generated in many different production areas throughout the NGPF and stored in temporary hazardous waste storage cabinets. Waste management personnel at the NGPF work closely with these three facilities to properly handle, package, store, and dispose of waste in a safe and environmentally friendly manner.
- SNL/NM Customer Support Teams: SNL/NM Customer Support teams (CST) provide comprehensive environmental, industrial hygiene and safety engineering support for NGPF. The ES&H Support Team members are responsible for providing cost-effective guidance, consultation, and options to NGPF consistent with operational goals, SNL/NM policies/practices, and regulatory requirements, supporting implementation and maintenance of the Integrated Safety Management System (ISMS). Additionally the CST is responsible for advising customers in a timely manner through the appropriate management chain on ES&H issues observed, including recommended alternatives for correction.
- SNL/NM Pollution Prevention (P2) Specialist: A change made in FY02 due to NGPF's 2002 Green Zia cycle was the addition of a P2 specialist to NGPF's staff. NGPF management has made a commitment to fund a P2 specialist from SNL/NM's P2 program for 20% of their time to assist in water, energy, and waste reduction measures. The P2 program as a whole is considered a partner because it does not receive any direct funding from NGPF. The relationship between NGPF and the P2 program is described under partnerships.

**Partners** are defined as organizations or entities that work together with the NGPF for their mutual benefit with no actual financial considerations taking place. NGPF has developed partnerships with a variety of internal SNL/NM organizations to promote pollution prevention within their organization and the larger SNL community. Partners include:

- SNL/NM Procurement: SNL's Procurement Center: Sandia's Procurement Center is continuously striving to maximize the effectiveness of its purchases. Using quality practices, Procurement is developing strategic partnerships with SNL organizations and suppliers that enable suppliers to better understand Sandia organizational requirements and participate as long-term partners in achieving Sandia's program goals. Procurement has established the goal of reaching 100% use of EPA-Designated Products. NGPF aids Procurement in reaching these goals by purchasing recycled office products and bio-based cleaning solutions.
- SNL/NM Pollution Prevention (P2) Program: The SNL/NM P2 program assists the NGPF by providing technical support on environmental issues. P2 is heavily involved in NGPF's green purchasing, process improvements, and implementation of a formal environmental management system. Additionally the P2 program is responsible for reporting quarterly waste generation and green purchasing trends to the facility.

## GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA

- SNL/NM Chemical Exchange: SNL/NM has a virtual chemical exchange program that is operated by the Hazardous and Solid Waste Department. The chemical exchange is designed so that excess chemicals that are useable can be redistributed to another user. The NGPF is one of SNL/NM's largest producers of hazardous waste so the partnership between the NGPF and the Chemical Exchange is important for the sustainability of the chemical exchange and reducing NGPF's hazardous wastestream.

**Stakeholders** are defined as organizations or entities that have an interest in or are affected by the actions of the NGPF but do not fall into the other categories. The major stakeholders are local community businesses and city, state, and federal regulators. As mentioned in Category 1 the NGPF is a weapon's component facility so community interaction is limited to SNL sponsored activities. The other major groups of stakeholders are federal, state and city regulatory agencies. The NGPF is one of several SNL facilities that are regulated by multiple agencies. The appropriate SNL corporate Subject Matter Expert (SME) coordinates regulatory interaction with these agencies. NGPF personnel provide all necessary information through the corporate SME for any regulatory audits. Results of regulatory audits are described in Category 7.

### Category 4: Information And Analysis

***How does your organization select, collect, and manage information to understand the environmental and energy-associated aspects associated with the design or production of a product or service?***

#### Selection Process

As mentioned in Category 2: "Planning for Continuous Environmental Improvement" NGPF annually participates in the SNL/NM Performance Appraisal process by performing an Appraisal Self-Assessment against specific performance evaluation criteria negotiated with DOE/NNSA at the beginning of the fiscal year. These criteria typically relate to areas of special interest to DOE/NNSA. The assessment drives the development of annual strategic plans and process specific action planning.

New externally mandated environmental issues may be received at any time from SNL/NM management or from revision to the prime contract. These issues are discussed at NGPF management meetings and added to either strategic planning or action planning as appropriate. If there is any issue with complying with externally mandated issues NGPF management provides feedback through the Line Implementation Working Group (LIWG). LIWG is a cross-organizational group within SNL that meets on a monthly basis to discuss a variety of issues related to work at SNL. A sub-team of LIWG is specifically dedicated to ES&H. NGPF provides a representative to this sub-team to provide facility ES&H feedback to SNL's other organization.

## ***GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA***

### Collection Process

Information collection is reviewed and revised on an annual basis based on the self-assessment and the action plans.

Sources of information are collected both through NGPF directly and through their supplier relationship with SNL/NM Waste Management and SNL/NM Pollution Prevention. SNL/NM Waste Management and Pollution Prevention maintain a number of databases (i.e., waste generation, green product purchases) to provide line and support organizations with operational cost data.

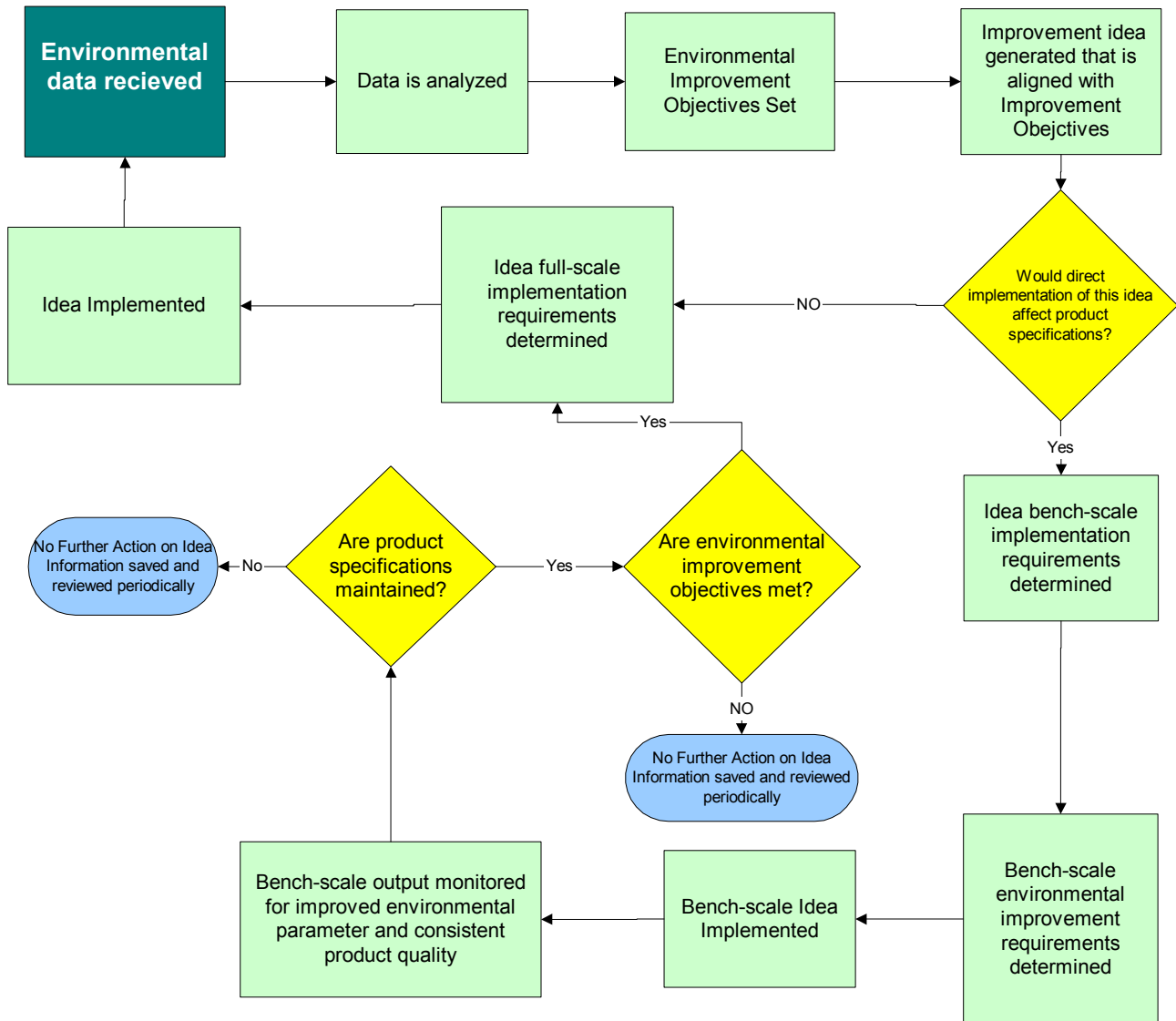
NGPF has moved beyond Baseline collection of information merely for compliance or contract purposes. Information collected includes the monitoring and evaluation the equipment/product to ensure that the equipment/product is doing its job in a safe, efficient, and environmentally friendly manner. Areas that NGPF has determined are important for their business to consider include the life cycle impacts of products they purchase.

### Information Management

Information gathered whether on a monthly, quarterly, or annual basis is reviewed and compared to the FY goals in management meetings. In 2001 waste generation data from NGPF was reviewed to determine if additional waste reduction opportunities could be identified. These reviews prompted a PPOA that initiated the continuous improvement process discussed in Category 2. The use of waste generation, operational, and material cost data provide the information necessary to perform a cost-benefit analysis to support the recommended reduction measures. This information has since been used to make changes to NGPF's environmental impact including the review of an solvent recycling system and compaction of contaminated personal protective equipment.

The NGPF utilizes the information gathered to establish pollution prevention and energy-associated goals annually for the FY based on the annual self-assessment. The NGPF's 14403 Department manager is responsible for leading a team of employees in developing these goals. This combined effort between management and employees allows for realistic achievable environmental goals to be set. The decision making process is outlined in Figure 10.

**GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA**



**Figure 10: Process Improvement**

***How does your organization use information to make decisions on service, product design, and process improvements as part of the continuous environmental improvement approach? How does your organization use comparative information or benchmarking to improve environmental and energy-associated performance of services, production processes, or product design and strive to be best in class?***

NGPF is the only production facility in the nation responsible for the manufacturing of neutron generators. The uniqueness of the facility has limited the ability of the facility to benchmark, but the NGPF has determined that for it to continue to improve that it must strive to be best in class by emulating best identified practices. NGPF has identified four general categories of benchmarking opportunity, which includes:

- Other SNL/NM organizations
- Other DOE/NNSA facilities
- Lockheed Martin facilities

## GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA

- Commercial industry

NGPF has started to work on a plan to use these benchmarking opportunities to establish specific partners and to use those partners to aid in establishing FY improvement goals. NGPF's Green Zia team is responsible for completing this plan.

### Category 5: Employee Involvement

***How does the organization assess skill levels and provide training and education to employees to enable them to actively participate in the continuous environmental improvement approach?***

#### Employee Preparation

To enable all employees to participate in continuous environmental improvement the NGPF has taken a two-pronged approach. First, employee recruitment, employees at NGPF are among the best in their business. Only the highest qualified candidates are offered positions after an extensive interview process that takes into account formal educational training and years of experience. Second, employee retention, to ensure that NGPF is able to keep the best employees NGPF management works with SNL/NM Human Resources to consistently offer salary and benefits on par with, if not above, private industry.

Additionally to ensure that all employees are aware of all new and existing ES&H requirements, training and awareness opportunities are provided. ES&H training is provided on an annual basis through NGPF's supplier for environmental education and the CST. The CST team member in charge of environmental issues annually performs on-site ES&H training to ensure that all members of the work force are active members in NGPF's environmental management system.

NGPF has an extensive awareness program that includes a picture of the month through NGPF's Employee Safety and Security Program (ESSP). The ESSP is a management-funded team of volunteers from across 14000 that include all levels of employees from management to on-site contractors. The ESSP team meets on a monthly basis to decide on a picture topic. The picture is then posted on the Center website and employees are asked "Is there anything wrong with this picture?" and an additional five to ten questions related to the topic of the month. The employee then receives via email a voucher for an ESSP buck. ESSP bucks can be saved up and redeemed for prizes. Past topics have included reapplying materials, safety around security doors, handling sensitive material, and radiation safety. The ESSP program traditionally has been an awareness program for safety and security topics, but this year 14000 will also be including environmental topics. April's picture topic is managing hazardous waste at work and at home.

***How is employee input included in all aspects of the environmental management system including the development and implementation of action plans? Also, how are employees involved in non-operational ways to meet the organization's environmental and energy goals or to address community specific problems?***

Employee Involvement

Employees are actively involved at all stages of environmental improvement from product evaluation and selection to implementation. NGPF's management is very aware that for continuous environmental improvement to occur that employee feedback and involvement is essential. To address employee involvement in a proactive manner NGPF management has supported the use of NGPF's employees as active participants in the evaluation of environmentally friendly products through the PPOA process. Employees are active members of the PPOA team that evaluates the processes, recommends alternative, implements the recommended alternative, and monitors and evaluates the implemented solution.

The director of NGPF holds weekly management meetings with all department managers. Department managers in turn hold meetings with their staff with frequency varying from weekly to monthly depending on the department. The Director is updated on facility operation in the weekly management meetings. Any employee issue or concern would flow-up to the Director through this mechanism unless the employee issue is regarded as an emergency due to a spill, system failure, or personnel accident in which case the director would be notified immediately.

Additionally NGPF management encourages upward feedback from employees regarding NGPF's management performance. All employees have the opportunity to "Dine With The Director." A luncheon sponsored by Center 14400 where only employees and Director are invited, no other management is present. These luncheons allow for employees to have open and frank communication with upper management regarding their facility.

***How does your organization consider employee value and well being as part of the continuous environmental improvement approach?***

SNL's number one priority is for work to be done in a safe manner that considers the well being of the worker and the worker's environment. SNL's Integrated Safety Management System (ISMS) was developed to ensure the safety of every Sandia employee. ISMS is a five-step process that allows Sandia to manage work safely. Figure 4 demonstrates the five elements of ISMS: plan the work, analyze the hazards associated with the work, control and mitigate the hazards identified, perform the work, and provide feedback and improvements. To ensure that the ISMS process can be effective SNL mandates training appropriate to the job. The appropriate vendor or the NGPF provides specialty training for process changes or installation of new equipment.



## GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA

ISMS uses two software modules to ensure minimum ES&H compliance requirements are met. The Preliminary Hazard Screening (PHS) module helps determine if a new process meets compliance standards for health and safety, emissions to air and water, and waste generation. The National Environmental Policy Act (NEPA) module determines if new process are addressed under existing NEPA documentation. The Center ES&H coordinator completes the modules with the line personnel and they are reviewed by appropriate Subject Matter Experts (SMEs). If certain criteria are met, a Hazard Assessment is then performed by the SME. Based on the results of the two modules, Operating Procedures (OP's) are written to ensure hazards are eliminated or mitigated. The OP's and PHS/HA modules are reviewed annually and updated as required. All employees wear a badge that identifies the ISMS approach and a quick reference card that identifies important site-wide emergency and non-emergency numbers that are essential for workers to perform their work in a safe manner. Figure 11 is the Sandia National Laboratories ISMS star.



NGPF specifically addresses employee related value and well-being issues on multiple levels. NGPF's management addresses employee concerns depending on the level of difficulty in several manners. Concerns that are easily resolved are done on the spot. Issues that are less easily resolved are approached in a stepwise manner. Concerns are first brought to the attention of the Area Safety Representative (ASR). The ASR program is an employee-based safety program that is modeled after a successful program at other DOE/NNSA sites and in private industry. The ASR team consists of a volunteer from each work team that consists of represented people. The volunteer works within this team to develop safety campaigns, share lessons learned and to provide a contact to resolve safety issues and practices. Then the concern is brought to the attention of the immediate supervisor and then to NGPF management.

## **GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA**

Employees are recognized for their contributions to team or individual success or accomplishments through the use of SNL based Team Celebrations or Spot Awards. Team Celebrations are a formal recognition device where team members are provided with a lunch and formal recognition for their efforts. Spot awards are monetary or gift awards for individual special performance, they are accompanied by formal recognition when monetary gifts are provided and are less formal when small awards such as a gift certificate for a local restaurant or movie passes are provided.

### **Category 6: Process Management**

***How does your organization systematically analyze its processes to understand environmental impacts and their causes?***

It is NGPF's policy to acquire and manage supplies, materials, property, in a timely, customer-focused, and cost effective manner, subject to applicable requirements. How NGPF systematically analyzes its processes was discussed in detail in Category 2: "Planning for Continuous Environmental Improvement" and in Category 4: "Information and Analysis."

***How does your organization control the operations of processes to reduce potential environmental impacts?***

Some of NGPF's processes involve the use of hazardous materials, safety and environmental considerations are integral to key work activities. Managing work process efficiently is a primary requirement for remaining cost competitive. Process management includes cost, schedule, quality, safety and health as well as environmental impacts, waste management, and record keeping. Processes fall into two broad groups. These are:

1. Processes required by SNL to conform to Laboratory wide needs. These include basic training identification and reporting, health and safety work practices and reporting, procurement, and budget and schedule tracking. The work follows the specified processes such as the ES&H Manual that are provided.
2. New processes where specific requirements are not prescribed. Controls for these processes are either designed by a group or by an individual that appears to be the most appropriate owner for the activity. For formal activities, peer review is used when the process has wide use or impact. These are often described in NGPF's written procedures.

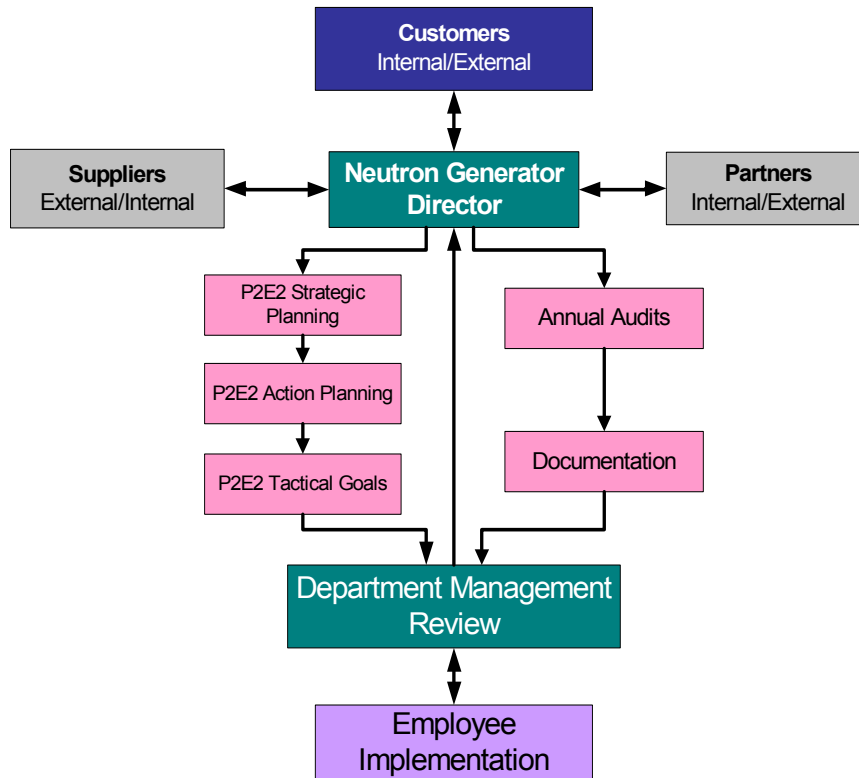
There are three main process control tools: NEPA/PHS/HA software (see Category 5), Pollution Prevention Opportunity Assessments (see Category 2), and Operating Procedures (see Category 5).

With management input, engineers and scientists working on a new project evaluate new processes for ES&H concerns using the ISMS Software. These results are reviewed by the SME and documented in the Hazard Analysis (HA). Operating Procedures are created to ensure ES&H hazards are incorporated into the way the process is controlled.

**GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA**

Annual reviews of the Operating Procedures and Self-Assessments ensure the currency of the procedures and provide for continuous improvement. Regular PPOA's are scheduled to evaluate existing processes to reduce waste and energy costs.

Processes are systematically analyzed utilizing NGPF environmental management system. The type of analysis is specific to the process. Analysis tools were identified in Category 4: "Information and Analysis." Figure 12 is a graphic representation of NGPF's Environmental Management System. As discussed in Category 2: "Planning for Continuous Environmental Improvement." Requirements established by NGPF's two main customers (See Category 3) are used during the annual self-assessment. The self-assessment determines both strategic planning and action planning. Both partner and supplier feedback is used in the development of action plans. Planning could include administrative/management improvements or specific areas for mechanical process improvement. Employee feedback gathered through staff meetings is then used in the management review of the improvement and incorporated into the following year's self assessment.



**Figure 12: NGPF's Environmental Management System**

**Community Category 7: Results**

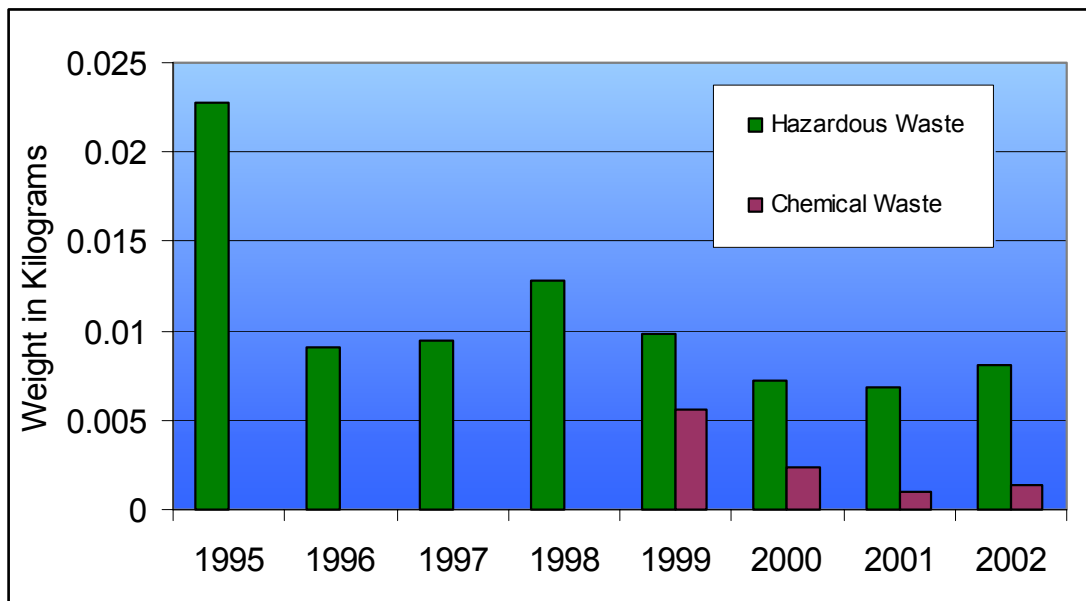
**Summarize your organization's environmental and energy-associated results. Show current levels and trends including regulatory compliance. Show relevant benchmark data or other forms of comparative data.**

**Regulatory Compliance**

In NGPF's six-year operating history no enforcement letters have ever been received from the New Mexico Environment Department or the Environmental Protection Agency.

**Waste Reduction**

The NGPF is in the 6<sup>th</sup> year of a 25-year facility life. Production at the facility is not at full capacity and is still in the process of "ramping up". This affects the production of physical wastes and use of resources. NGPF ES&H professionals and management are working very hard to reduce where possible all wastes that the facility produces, but since the facility is not at full capacity and number of man-hours worked is increasing their waste streams are also still increasing. Figures 13, 14, and 15 are the results of NGPF integration of environmental management into the production process. All three graphs show the amount of waste produced per total man-hours worked at the facility.



**Figure 13: Hazardous and Chemical Waste Produced Per Man-Hour Worked**

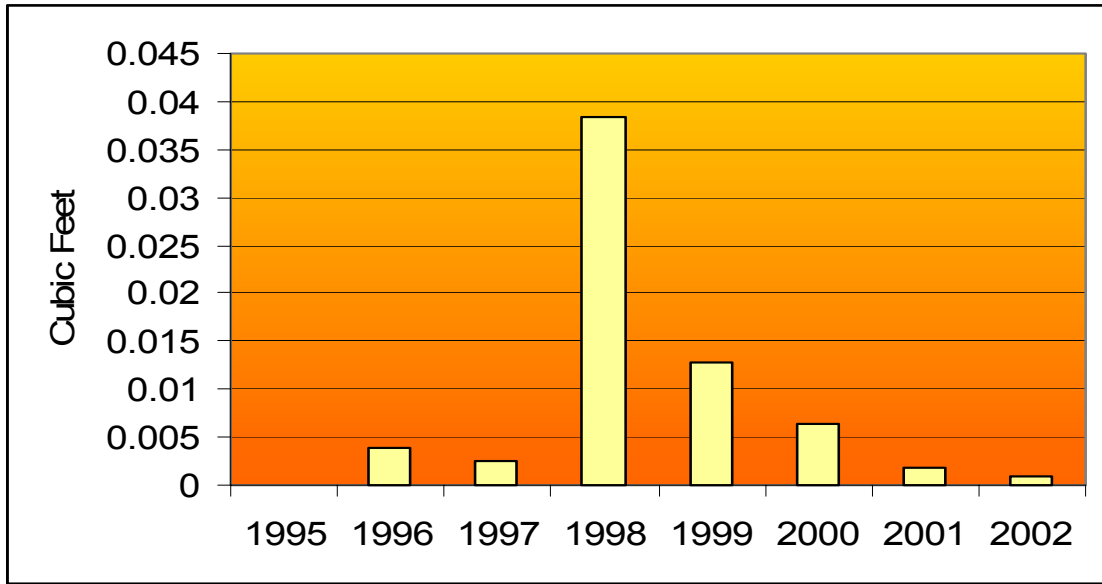


Figure 14: Low-Level Waste Produced Per Man-Hour Worked

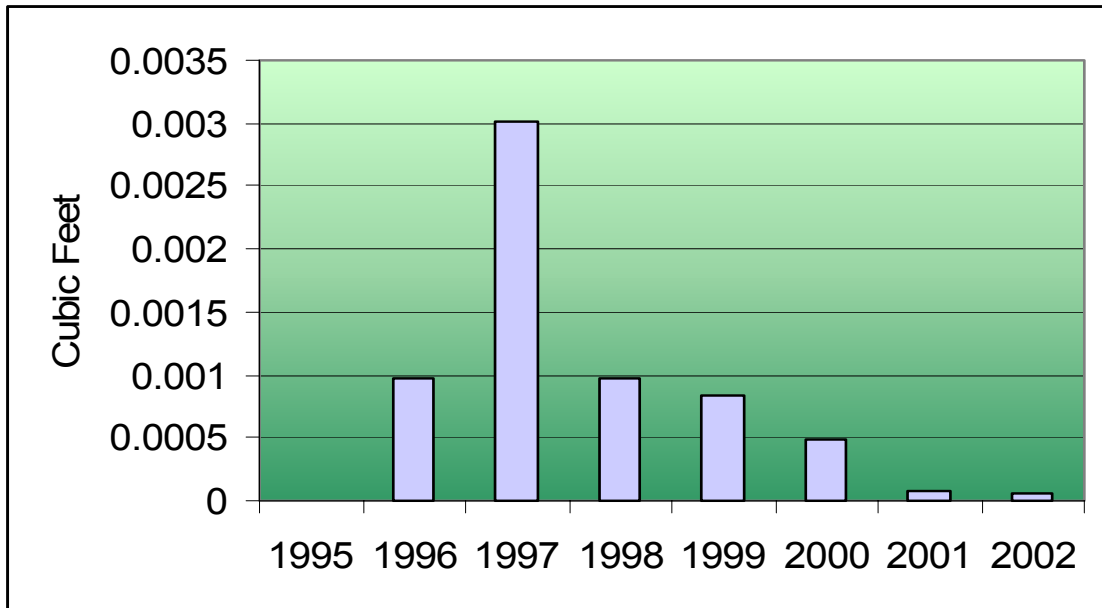
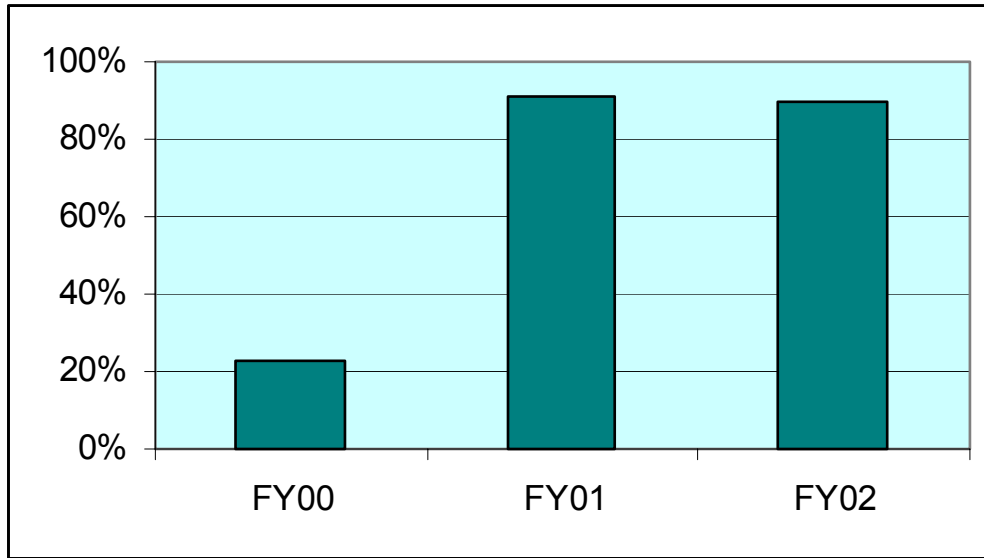


Figure 15: Mixed Hazardous/Low-Level Waste Produced Per Man-Hour Worked

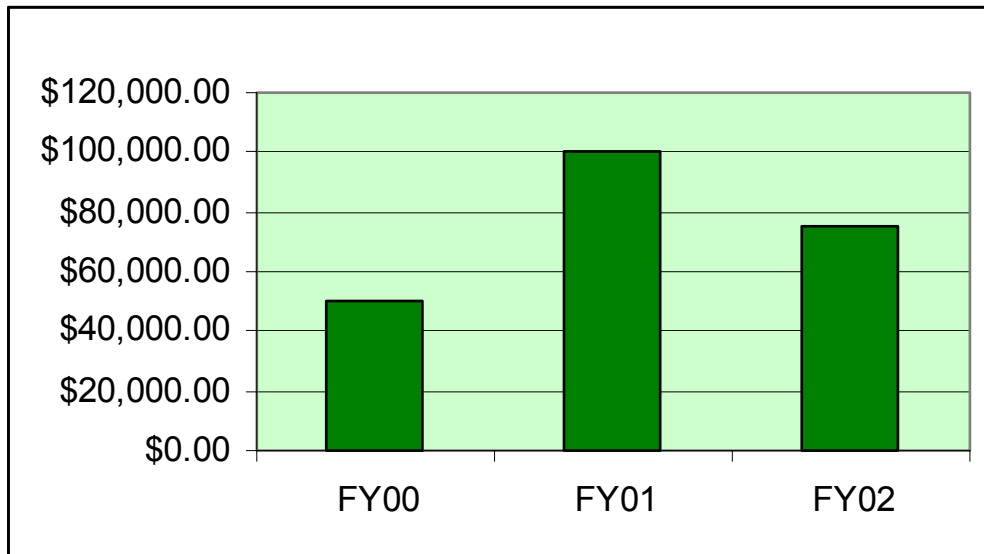
*GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA*

**Green Purchasing**

Figures 16 and 17 show the results of NGPF's green purchasing efforts for office products. Office products tracked are benchmarked from the Environmental Protection Agency's Comprehensive Procurement Guidelines products include copier paper, plastic desktop accessories, toner cartridges, paper products such as Post-It notes, and envelopes. A complete list of products can be found at <http://www.epa.gov/cpg>.



**Figure 16: Percentage of Office Products Purchased with Recycled Content**



**Figure 17: Total Dollars Spent on Recycled Office Products**

*GREEN ZIA ACHIEVEMENT RECOGNITION CRITERIA*

***Summarize customer, employee, community, supplier, market, and other interested parties results within the context of the continuous environmental improvement approach. Show current levels and trends including benchmark data or other forms of comparative data.***

The NGPF's Employee Safety and Security Program (See Category 5) had a participation rate of 59% in FY02, which is up 11% from FY01.

***Summarize your organization's financial performance results related to the implementation of your continuous environmental improvement approach. Show current levels and trends including benchmark data or other forms of comparative data.***

SNL's Waste Management Facilities that are utilized almost daily by operations at the NGPF: The Hazardous Waste Management Facility (HWMF), Solid Waste Transfer Station (SWTF), and the Radioactive and Mixed Waste Management Facility (RMWMF) (See Category 3). SNL's HWMF and RMWMF charge the NGPF for management, transporting, and disposing of NGPF's waste. Waste is charge for disposal in kilogram or cubic feet. Any reduction in waste also has a cost reduction associated with it. Since 1999 the NGPF has saved over \$400,000 due to optimizing their waste management program.

A couple of waste management cost savings programs were implemented at the NGPF over the last couple of years. The first was to profile "Non-Hazardous" waste out of the Hazardous Waste disposal routes. This included materials that could be put into the solid waste dumpsters that in the past had been managed as "Non-Hazardous" waste. This had an annual cost savings of almost \$50,000 per year. Another cost savings approach was the elementary neutralization of Low-Level Radioactive "Mixed" waste from the NGPF analytical laboratory. The management of "Mixed" waste is very time consuming and expensive. By simply asking chemists to add a caustic material to this waste stream the material could be solidified and managed as low-level waste. A One-time notification for treatment of this type of material was sent to NMED and this has had about \$15,000 per year cost savings. Another waste management cost savings program was the compaction of Low-Level PPE from the NGPF. The NGPF is the largest generator of Low-level waste at Sandia and this material was not being compacted prior to disposal in the Nevada Desert. A PPE compactor was purchased and approximately 21 cubic feet of this material in now being compacted into a 7 cubic foot drum. This has an annual savings of \$50,000. The most successful waste management cost saving program was the bulking of solvent waste from the NGPF. The NGPF is charged for the management of waste and since this is the largest hazardous waste stream at the NGPF a bulking program was implemented. Solvent bulking has saved the NGPF almost \$150,000 per year.

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