

DEVELOPING THE STRATEGIC PLAN FOR POLLUTION PREVENTION IN DEFENSE PROGRAMS

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ABSTRACT

In order to provide effective leadership and to ensure a consistent pollution prevention effort in all of its production facilities and laboratories, Defense Programs (DP) Headquarters, in close cooperation with the Field, has developed a strategic plan for its Pollution Prevention Program. The strategic plan is built upon the history of waste minimization, waste reduction, and pollution prevention activity to date, and articulates both long- and short-term strategies to ensure program initiation, growth, and stability. The organization of the program, including Headquarters staffing and linkages to the field, is described. Life-cycle analysis of program barriers and bottlenecks, along with associated initiatives and action plans are discussed.

BACKGROUND

The Department of Energy (DOE) waste reduction policy requires all DOE operations to reduce the total amount of waste that is generated. A comprehensive program to accomplish that goal was instituted in 1990. Defense Programs began the development of its pollution prevention strategic plan in June, 1991. A final draft is now in the concurrence process with the Assistant Secretary's office.

The Department's policy establishes a hierarchy of environmental practices. The generation of waste is first to be eliminated or reduced through source reduction. Waste that cannot be eliminated at its source is to be recycled using environmentally safe practices. Waste that is nevertheless generated is to be treated in an environmentally safe manner to reduce volume, toxicity, or mobility before storage or disposal.

The Office of Inspector General (IG) audited DOE's Waste Minimization Program and filed a September 3, 1991, final report on *Department of Energy's Waste Minimization Program*. The report commented on "...three conditions that were inhibiting implementation of waste minimization action: a lack of incentives to reduce waste, minimal program guidance, and uncertainty of funding." The strategic plan is, in part, a DP response to the IG recommendations; it applies specifically to the DP responsibility of ensuring that waste is minimized during the execution of line operations associated with both production and research.

Factors that drive pollution prevention/waste reduction include legal requirements, potential for liability, waste management and disposal costs, and public relations benefits. An abbreviated outline of specific drivers is included in Appendix A.

MISSION

The mission of the DP Pollution Prevention Program is to develop, coordinate, implement, and maintain consistent, practical, and verifiable pollution prevention efforts. The Pollution Prevention Program is of vital interest to DP because it commits management to pollution prevention principles and to realizing the economic value of hazardous waste reduction before treatment, storage, and disposal. This commitment is

essential to the function of DP as it evolves into the Complex 21 reconfiguration. Commitment demands top *management involvement and support*, a *formalized strategy*, and *awareness programs* because it is difficult. The strategy and organizational structure of DP's strategic plan incorporate these elements.

STRATEGY

The plan's strategy is a set of decision-making modules for guiding DP's pollution prevention/waste reduction implementation; it includes a startup strategy and a long-range strategy. The startup strategy focuses on developing, coordinating, and implementing pollution prevention/source reduction initiatives. The long-range strategy focuses on identifying and filling programmatic gaps to maintain consistent, practical, and verifiable pollution prevention/source reduction efforts. This approach has three far-reaching goals: 1) long-term reductions in the amount of all pollutants released to the air, water, and land; 2) reductions in the amount of wastes generated at research laboratories, production plants, and support facilities; and 3) management of remaining waste to reduce volume, toxicity, or mobility.

STARTUP STRATEGY (THROUGH FY 1992)

Issue management is coupled to a long-range strategic approach to deal with interim program deviations. These deviations may be created by new opportunities or by identified program weaknesses. This is a systematic tactic for quickly responding to program deviations, changing program direction, and addressing high-priority issues. Early identification of such challenges and quick response will be ensured in the following ways:

- continuous surveillance, both inside and outside DOE, for any key strategic program planning issues (see Table I) that may arise;
- resolution by DP staff members when such issues arise; and
- identification of appropriate unresolved program planning issues for resolution during the budget review process.

TABLE I

Key Strategic Commitment/Issue List

- Policies, plans, procedures, or practices
- Funding
- Employee awareness/training
- Employee achievements and incentives
- Information exchange/technology transfer
- Management commitment and performance
- New/reconfigured plant design
- Measurement/tracking/reporting procedures
- Process waste assessments and prioritization
- Quality assurance and standards
- Research and development
- Committees/organizations
- Goal setting

Note: Any single issue may become top priority and need immediate attention at any given point in time.

The startup strategy is focused on responses to existing weaknesses in early initiatives and actions and the management of issues through surveillance, evaluation, and coordination. Coordination of actions and response to issues will be ensured in the following complementary ways:

- Managing program issues will be the responsibility of the DOE-HQ DP Pollution Prevention Program Coordinator and staff with resources and authority to initiate prompt action. This staff group will be concerned with managing pollution prevention/waste reduction issues, evaluating their impact and timing, and alerting other decision makers. In addition to routine tasks, the staff will be responsible for evaluating key strategic issues, assigning priorities, and monitoring project status.
- The DOE-HQ Waste Reduction Steering Committee or the Waste Minimization Management Group

will be responsible for assessing the relative importance of pervasive issues, deciding how they are to be treated, and assigning responsibility for their resolution. See Appendix B for a description of the mission and composition of these working groups.

LONG-RANGE STRATEGY

The long-range strategy is designed to permit early implementation of pollution prevention initiatives. This will be accomplished through well-defined planning modules that are used to establish a set of strategic objectives (See next section). The difference (the gap) between current reality and the strategic objective will be estimated. Restrictions and requirements, such as the IG recommendation in the final report on DP's waste minimization program, are recognized as constraints that *must* be met for the Pollution Prevention Program to be viable. Initiatives and action plans will be developed and tested when gaps are identified or as constraints change with the dynamics and life of the program. Long-range strategy is focused on balancing identified program gaps with program initiatives and action plans.

POLLUTION PREVENTION/WASTE REDUCTION PLANNING

Five planning modules were used in developing DP's time-phased strategic plan: Initiation; Source Reduction/Process Control; Waste Stream Control; Research and Development (R&D); and Reconfigured Production Facilities. Table II is the budget forecast for all FTEs (headquarters) needed over the next five years. Each module is broad and contains specific strategic objectives and explicit initiatives and action plans. The plan anticipates program gaps and constraints and identifies initiatives and action plans. Additional gap-filling initiatives and action plans will be developed or improved as constraints change with the dynamics and life of the program. Routine tasks to guide and control the program include the following activities:

- regular review, analysis, and update of requirements, policies, guidelines, plans, directives, specifications, standards, opportunity selection criteria, and process waste assessments (waste minimization opportunity assessments, or PWAs);
- exchange of information with the DP-wide newsletter and Waste Information Network;

TABLE II

HQ Pollution Prevention Program Budget Forecast (Thousands)

PHASE	1993	1994	1995	1996	1997
Initiation	\$ 525.0	\$ 150.0	\$ 0.0	\$ 0.0	\$ 0.0
Source Reduction/Process Control	\$ 262.5	\$ 337.5	\$ 287.5	\$ 362.5	\$ 375.0
Waste Stream Control	\$ 75.0	\$ 187.5	\$ 412.5	\$ 450.0	\$ 450.0
R&D	\$ 12.5	\$ 200.0	\$ 275.0	\$ 327.5	\$ 200.0
Reconfigured Production Facilities	\$ 0.0	\$ 0.0	\$ 0.0	\$ 50.0	\$ 150.0
Totals	\$ 875.0	\$ 875.0	\$ 975.0	\$ 1,190.0	\$ 1,175.0

Cost estimates are in FY '92 dollars and reflect burdened rates of \$125K/FTE.

- continued review and analysis of DP facility Waste Minimization/Pollution Prevention Awareness Plans and waste reduction reports for acceptable content and trends;
- implementation of corrective action plans where identified constraints exist;
- support and participation in information exchange and problem-solving forums, such as the Waste Reduction Steering Committee, workshops, and site visits;
- development, organization, and conduct of training courses;
- maintenance of a record of DP waste reduction activities;
- performance and documentation of waste stream reduction and economic/impact analysis;
- maintenance of a documented basis for the program; and
- regular report on short-term results.

Initiation Module

The strategic objectives of this module of the plan are to encourage change in DOE culture, develop policy and awareness plans, and fund waste stream assessments. This includes staffing and appointment of DP field level Pollution Prevention Coordinators with responsibility for coordinating day-to-day pollution prevention/waste reduction activities (PWAs; pollution prevention implementation, and progress reporting; review, resolution, and dissemination of significant pollution prevention issues (such as goal setting, management award fees, chargeback fees, and employee awareness); economic analysis (i.e. cost/benefit analysis, life cycle cost analysis) of pollution prevention opportunities; and support of special pollution prevention training). The Initiation Module began in FY 1988 and will continue until the following initiatives and action plans are complete:

- develop budget guidance with clearly defined funding sources, a chargeback position, and other incentives to support DP pollution prevention/waste reduction activity;
- participate in the development of policies, guidelines, strategic plans, and directives for DP waste reduction activities and provide such direction to field organizations and laboratories;
- develop program guidance for project selection criteria that includes priorities, economic analysis, impact of waste stream reductions, and technology exchange between design laboratories and production plants;
- develop technology exchange within and between laboratories and plants;
- establish a tracking and follow-up system on project completion and implementation;
- issue goal-setting strategy guidelines;

- support development of departmental crosscut strategic planning for waste minimization as directed in the Secretarial Planning Guidance for FY 1994;
- provide a benchmark with the private sector;
- establish measurable programmatic goals that are relevant to the development of a pollution prevention program and quantified goals that are relevant to the implementation of the pollution prevention program that may be used as meaningful demonstrations of performance;
- create an awareness campaign with a DP pollution prevention newsletter and a display board; and
- develop a DOE and contractor awards and recognition program as an incentive for pollution prevention.

The major gaps identified by the IG* in this module are funding uncertainties, minimal DOE-Headquarters program guidance, the ad hoc fashion in which waste minimization opportunities have been approached, and the limited use of incentives such as waste reduction goals, management award fees, and individual awards. Additional gaps include inadequate information on pollution prevention opportunities and waste reduction effects, and a lack of in-house capability to assess and evaluate pollution prevention opportunities.

DP has participated in publishing three guides during the initiation phase: *Implementation Guidance to DOE Order 5400.1*, the *Model Waste Minimization and Pollution Prevention Awareness Plan*, and the *Model Process Waste Assessment Plan*. Activities continue in developing and issuing policies, guidelines, plans, and directives. These efforts are the cornerstones of the DP pollution prevention program and have provided consistency in pollution prevention activities across DP.

Source Reduction/Process Control Module (Initial Implementation)

The strategic objectives of this module are to implement controls on the source of waste through source reduction and process controls. The Source Reduction/Process Control Module began in FY 1989 and will continue until the following initiatives and action plans are complete:

- establish a strategic budget with line item funding specifically earmarked for pollution prevention and allocations for process waste assessments, pollution prevention awareness, and tracking/reporting systems;
- develop pollution prevention/waste reduction audit concepts and practices;
- train all DP employees as part of the orientation program, customize training as required, and include training participation in performance evaluations;
- identify and implement specific waste minimization incentives for line management (e.g., management award fees and recognition programs);
- establish realistic and specific programmatic and numerical goals;

* Office of Inspector General findings in the final report on DOE's waste minimization program.

- develop methods for demonstrating/measuring performance and reporting costs and savings associated with pollution prevention;
- provide guidance for performance and progress measurement;
- prepare an inventory of DP waste reduction activities;
- prepare a validation process focusing on successes; and
- develop cost accounting and cost allocation guidance.

The major gaps identified by the IG in this module are funding uncertainties, minimal program guidance, and limited use of incentives to emphasize waste minimization. Other gaps include uncertain data on waste reduction methods and pollution prevention opportunities, adequate expertise to evaluate and implement waste reduction, unfamiliarity of waste management issues at the decision-making level, misplaced incentives, arbitrary goal setting, skepticism, procrastination, and timeline slips.

Waste Stream Control Module (Capital-Intensive Implementation)

The strategic objectives of this module are to implement the capital-intensive processes and modifications for the waste streams. These objectives are achieved through recycling and reclamation initiatives, toxicity-reducing initiatives, equipment to remove contaminants from waste, detoxification and neutralization, volume reduction, and processing for resource recovery. The Waste Stream Control Module began in FY 1990 and will continue until the following initiatives and action plans are complete:

- establish a budget with line item funding for specific pollution prevention process modifications, allocations for program staffing, and quality assurance (QA);
- establish outreach to other federal agencies;
- compare practices with the private sector;
- develop and issue field QA guidance;
- develop a Total Quality Management Plan and implement it for the program; and
- develop a strong intraagency outreach program to transfer pollution prevention/waste reduction techniques among production plants, research laboratories, and other waste generating facilities.

The major gaps identified in this module are funding uncertainties, few readily available waste reduction technologies, limitations imposed by product specifications/quality requirements, and discouragement with program progress.

Research and Development Module

The strategic objective of this module is to reduce waste through research, development, and demonstration of pollution prevention technologies. The R&D Module began in FY 1991 and will continue until the following initiatives and action plans are complete:

- establish a budget for pollution prevention/waste reduction R&D;

- develop pilot technologies that facilitate pollution prevention;
- develop field technology transfer guidance;
- develop and implement a model pollution prevention/waste reduction demonstration program in DP; and
- facilitate demonstration and programmatic adoption of successful R&D prototype programs;

The major gaps identified in this module are funding uncertainties, unavailable/undemonstrated technologies, and the limitations in the flexibility of DP's manufacturing processes.

Reconfigured Production Facilities Module

The strategic objectives of this module are to ensure that pollution prevention/waste reduction considerations are inherent in the planning, design, construction, upgrade of processes, and operations of new or reconfigured facilities and during deactivation of outmoded facilities. This module will begin in FY 1992 and will continue until budgets are allocated and process design, startup, and optimization are planned and implemented. The major gaps identified in this module are funding uncertainties and postponements because of program size.

STAFF REQUIREMENTS

The staff requirements articulated in the plan result from the fact that successful pollution prevention/waste reduction requires constant management attention, leadership, and advocacy. Developing, coordinating, and maintaining these efforts is a multiyear, multimillion dollar task with potential multibillion dollar, long-term return. In consultation with the Office of Environmental Restoration and Waste Management (EM), DP will provide pollution prevention direction to field organizations consistent with Departmental Orders and policies.

ORGANIZATION

The DP-Headquarters Pollution Prevention Program is responsible for implementing pollution prevention in DP. The organization uses existing manpower and present line management relationships. The Pollution Prevention Program is a staff organization under the Director, Office of Production Facilities. Historically, this organization's responsibility has included the EM interface for most DP facilities since FY 1990.

DP POLLUTION PREVENTION PROGRAM COORDINATING OFFICE

The Program Coordinating Office (DP-644) is responsible for the planning, direction, integration, guidance, and coordination of the program. The office evaluates source reduction and recycling techniques and applications; coordinates pollution prevention activities with EM, DOE field and site offices, other federal agencies and the private sector; provides guidance to the field for required goal-setting, tracking, and reporting systems; and coordinates meetings and workshops to promote the exchange of useful techniques and practices within DOE and with the commercial sector. The coordinating office will:

- direct the preparation of the site "roadmaps" for accomplishing DP's Pollution Prevention Program's goals;
- organize, coordinate, and participate in implementing a consistent pollution prevention/waste reduction effort throughout DP;
- coordinate pollution prevention/waste reduction activities with other federal agencies and the private sector;
- provide guidance to all DP DOE facilities for required goal setting, reporting, and tracking;
- facilitate and participate in meetings and workshops to promote the exchange of useful techniques and practices within DOE and with the commercial sector;
- coordinate the development of technical approaches to achieve real reductions in manufacturing and laboratory waste generation; increase the use of nonhazardous chemicals and chemicals that produce waste compatible with the environment;
- increase the use of recyclable chemicals and materials; and implement the design of new or redesigned products, processes, and facilities;
- direct the strategic planning efforts and ensure that waste reduction is considered in the design and upgrade of processes and operations; and
- advise top DP-DOE management on pollution prevention/waste reduction.

FIELD OFFICE ORGANIZATION AND STAFF RESPONSIBILITY

The Manager and the staff of the DOE Field Offices at Savannah River, Albuquerque, and Nevada and the managers of DP facilities at locations where other Program Senior Officials are the landlord (e.g., the Y-12 Plant and the Rocky Flats Office) have been instructed to take appropriate action to ensure that the objectives of the program are met. The Managers also have the responsibility to administer, provide support for, and generate employee awareness of the program, issue a written pollution prevention policy and prepare a Waste Minimization and Pollution Prevention Awareness Plan.

The Manager/Director of Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Sandia National Laboratories, Nevada Test Site, Mound, Pantex, Y-12, Pinellas, Kansas City, and the Processing and Reactor Facilities will appoint field level DP Pollution Prevention Coordinators. These coordinators will provide the central point for coordination within the waste generating organizations, and interact with HQ and other Program Senior Officials (PSOs) and other agencies on PWAs; DP pollution prevention implementation and progress reporting; review, resolution, and dissemination of significant pollution prevention issues (such as goal setting, incentives, and employee awareness); economic analysis (i.e. cost/benefit analysis, life cycle cost analysis) of pollution prevention opportunities; and support of special pollution prevention training.

The field level Pollution Prevention Coordinator will have direct access to the site manager/director and will serve as the chairperson of pollution prevention implementation commit-

tees for that site. The primary functions of such committees will be to implement the program and provide a mechanism for communication within the site and with outside communities on waste minimization matters.

APPENDIX A

DRIVERS FOR POLLUTION PREVENTION/WASTE REDUCTION

A.1 LEGAL REQUIREMENTS

- Clean Air Act (CAA)
- CAA Amendment of 1990
- Clean Water Act
- Toxic Substance and Control Act
- Resource Conservation and Recovery Act (RCRA)
- Hazardous and Solid Waste Amendments to RCRA
- Comprehensive Environmental Response, Compensation, and Liability Act
- Superfund Amendments and Reauthorization Act
- Pollution Prevention Act of 1990
- Occupational Safety and Health Act
- DOE Order 5820.2A
- DOE Order 5400.1
- DOE Order 5400.3

A.2 POTENTIAL FOR LIABILITY

- Spills and Cleanup
- Worker Exposure

A.3 WASTE MANAGEMENT AND DISPOSAL COST

- Reduced Life Cycle Costs
- Reduced Transportation and Handling Costs

A.4 PUBLIC RELATIONS BENEFIT

- Corporate *Good Citizenship*
- Stewardship

APPENDIX B

WORKING GROUPS

B.1 DEPARTMENT OF ENERGY HEADQUARTERS WASTE REDUCTION STEERING COMMITTEE

The Waste Reduction Steering Committee (WRSC) is chaired by Office of Environmental Restoration and Waste Management (EM) and chartered to improve the effectiveness of the Department of Energy's (DOE's) waste reduction activities. The goals of the committee are to increase information exchange, identify current and future data needs and reporting requirements, and guide future activities among DOE's programs and their respective sites. The WRSC is composed of one representative from the following offices: EM (Chairperson), Office of New Production Reactors, Office of Civilian Radioactive Waste Management, Office of the Assistant Secretary for Nuclear Energy, Office of the Assistant Secretary for Fossil Energy, Office of the Assistant Secretary, Conservation and Renewable Energy, Office of the Assistant Secretary for Defense Programs (DP), Office of the Assistant Secretary for Environment, Safety, and Health, and Office of the Director of Energy Research.

The responsibilities of the WRSC are to ensure coordination of DOE Headquarters (DOE-HQ) programmatic activities to minimize the generation of waste, to ensure coordination of DOE-HQ and field office waste reduction activities, to coordinate the sponsorship of workshops and promote training in waste minimization based on topics recommended by site representatives, to support development of policy and guidance for DOE waste reduction activities, to advocate appropriate programmatic funding for DOE waste reduction efforts within each major budget category.

B.2 WASTE MINIMIZATION MANAGEMENT GROUP

The Waste Minimization Management Group (WMMG) was formed in response to a Memorandum of Agreement with EM on waste management and waste minimization activities. The group ensures that appropriate applied research and development (R&D) for pollution prevention is carried out.

The group is chaired by DOE Albuquerque Field Office (AL) and integrates waste minimization R&D within the DP and EM organizations. The WMMG is made up of representatives from the following offices: (AL (Chairperson), EM, DP, Rocky Flats Office, Research laboratories (Los Alamos National Laboratory, Sandia National Laboratories, Lawrence Livermore National Laboratory), and Production Plants (Y-12 Plant, Pantex, Kansas City, Pinellas, Mound).

The responsibilities of the WMMG are to identify waste minimization issues, determine funding levels, analyze production plant and research laboratory proposals, recommend support for proposals to the funding agents within DP and EM, develop priorities and recommend funding levels for waste minimization projects that will be cofunded by DP and EM, and serve as an information exchange and technology transfer group.