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REPORT OF SURVEY CONDUCTED AT

OLEY VALLEY SCHOOL DISTRICT
OLEY, PA

MAY 1997

Best Educational Practices

Best Manufacturing Practices

BEST MANUFACTURING PRACTICES CENTER OF EXCELLENCE
College Park, Maryland
www.bmpcoe.org

Foreword

For more than a decade, the Navy's Best Manufacturing Practices (BMP) survey process has been a primary avenue for industry and government to present individual and distinctive success stories in management and manufacturing disciplines. For those organizations seeking to advance their overall manufacturing performance, the BMP program has provided validated and documented best practices. These practices, verified on-site by BMP survey team members, have served as a model for improvement in business and industry, and as a tool to promote teaming.

In 1995, industry and government representatives discussed the idea of broadening the BMP program's scope to incorporate success stories submitted by industry. The objective was to find an efficient, cost-effective way to share a greater volume of information on the latest technology and business developments. Since the BMP program had a proven approach for sharing success stories, this seemed to be a logical expansion.

The practices in this report on the Oley Valley School District, Oley, Pennsylvania were submitted to the BMP Center of Excellence by the National FFA Organization, in cooperation with the Pennsylvania Department of Education, as an example of some of the latest developments in the educational area. They are considered to be best practices or success stories; however, they were not validated by an on-site BMP survey team. The National FFA Organization did complete formal training from the BMP Center of Excellence, and modeled their Oley Valley survey after the BMP survey process. Our goal is to help industry, government, and academia keep pace with the rapid changes taking place in the business, manufacturing, environmental, and educational communities.

The National FFA Organization, a student organization for middle, secondary, and post-secondary agricultural education, supports its Local Program Success (LPS) initiative. The LPS initiative seeks to help agriculture teachers and their students become more successful by applying best practices in agricultural education. This joint effort of the National Council for Agricultural Education, the U.S. Department of Education, and the National FFA Organization provides resources that teachers can use immediately to enhance and improve their existing programs.

The final survey report, which details the findings, is distributed electronically and in hard copy to thousands of representatives from government, industry, and academia throughout the U.S. and Canada so the knowledge can be shared. BMP also distributes this information through several interactive services which include CD-ROMs, BMPnet, and the World Wide Web Home Page located on the Internet at http://www.bmpcoe.org. The National FFA Organization disseminates this information through local chapters, state leaders, and the National FFA Online Website at http://www.ffa.org.

The LPS initiative, in conjunction with BMP, is committed to strengthening the U.S. educational and industrial bases. Survey findings in reports such as this one at Oley Valley School District expand the goal of a stronger, more competitive, globally-minded, and environmentally-conscious American educational system and industrial program.

I encourage your participation and use of this unique resource.

Ernie Renner
Director, Best Manufacturing Practices

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Oley Valley School District

Section 1

Report Summary

Background

When the Best Manufacturing Practices (BMP) program conducted its first educational survey at Stafford County, Virginia, the survey team found several best practices such as Stafford's Teacher Selection Process and its Facilities Management program. The team was enthusiastic about this exemplary work in education and looked forward to the next opportunity to participate in an educational survey. Consequently, when the National FFA Organization approached BMP about supporting its Local Program Success (LPS) initiative, BMP readily agreed to provide support. The National FFA Organization is a student organization for middle, secondary, and post-secondary agricultural education students that makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth, and career success through agricultural education. BMP contributed its proven and highly successful survey model to an important effort coordinated by three educational and government entities.

The LPS initiative seeks to help agriculture teachers and their students become more successful by applying nationwide best practices in agricultural education. This joint effort of the National Council for Agricultural Education, the U.S. Department of Education, and the National FFA Organization, funded through the National FFA Foundation, provides resources that teachers can use immediately to enhance and improve their existing programs. The FFA applied to the BMP program for use of its best practices survey model to identify, document, and disseminate information on best strategies and resources in education.

The National FFA Organization developed the framework for its best practices based on a national initiative for agricultural education. Nationally, agricultural education is driven by a strategic plan that contains the mission and seven value-based goals. Through the LPS initiative, a set of priority actions was developed for achieving the mission of agricultural education through the proactive development of local agricultural education programs. The philosophy driving the action agenda is the belief that when local programs are successful, state and national programs will be successful. While the primary focus is on middle and secondary schools, the intention is that opportunities for seamless educational strategies and life-long learning related to post-secondary and adult education will result from this effort.

A national task force of teachers, education leaders, teacher educators, and business/industry representatives was formed. The national task force identified six key factors related to successful local agricultural education programs. These key factors were utilized by the National FFA Partner Development Team and provided the basis for the Best Practices surveys. The factor of professional growth was not addressed in this survey.

The LPS initiative uses five key areas of observation: Program Development and Marketing; Classroom and Laboratory Instruction; Building Partnerships and Mobilizing Volunteers; Work Based Learning (connections between the classroom and careers); and Student Leadership and Personal Development.

The Oley Valley School District in Oley, Pennsylvania was recommended by educational leaders because of its exemplary Agricultural Science program. The Oley Valley School District, which encompasses 65 square miles, is located approximately 10 miles east of Reading, Pennsylvania. The Oley Valley School District serves the residents of Alsace, Oley, Pike, and Ruscombmanor Townships. This District has a total population of approximately 13,000 residents.

The Agricultural Science program at Oley Valley supports a strong project-based, student-oriented philosophy. This unique program emphasizes integrated work skills which the student needs for successful application in the workplace following graduation. Core competencies are taught, followed by contextual learning through student projects. These classes and projects are continually augmented with field trips, business-sided instruction, and work-based learning programs so students can learn not only what the business process is, but also its real-world application. The entire process for approximately 125 students is guided and administered by one, full-time instructor and one, half-time instructor. Next school year (1997-1998), the Agricultural Science program is expected to use the half-time instructor on a full-time basis.

The survey team found that the instructor, as in all learning situations, remains the pivotal element to education by establishing the climate, delivering instruction, and ensuring the subject matter is taught in a way that students can easily comprehend and enjoy. Many students at Oley Valley emphasized that the instructors made the learning process a fun and enjoyable experience. Although balancing the instructional elements in any program can be overwhelming, the instructors at Oley Valley have successfully moved into a manager-of-resources role. The survey team soon discovered that even though there were many inputs into this program (e.g., local advisory board, school administrators, alumni input), the central role of the success of the program always came back to rest on the shoulders of the instructor. This teacher-as-manager, or in this case teacher-as-catalyst role, is effective in helping Oley Valley students establish basic competency, implement project-based applications, and integrate important work skills.

The pilot program at the Oley Valley School District provides a benchmark for other technical educational instructors, educational professionals, and teachers across the United States. In addition, the industrial and manufacturing base may benefit from some of the best practices cited at Oley Valley such as training methods, marketing strategies, and business/industry partnerships. The survey team found the following practices among the best — in other words, the elements of the program of which the teachers are proudest or those activities that could be duplicated in other programs to generate ideas for future growth and success nationwide. These practices are to be used as a resource for growth and development, and do not necessarily indicate the pinnacle of excellence has been achieved. The teachers in the Oley Valley Agricultural Science program are continually improving their program's elements.

Best Practices

The following best practices were documented at Oley Valley:

Information

The following information items were documented at Oley Valley:

Item	Page
Project Based Instruction	8
The Oley Valley program offers students an opportunity for practicing skills and knowledge, and applying those skills in real-life, oriented settings. Projects incorporate mathematics, science, business, and safety within the context of the real world.	
Career Exploration	8
The Agricultural Science program at Oley Valley offers students an opportunity to use learning styles other than a traditional classroom setting. This variety provides students with the maximum input in a style conducive to their abilities.	
Teacher as Manager: Results vs. Recognition	8
The Oley Valley program is successful due to student leadership of the Agricultural Education program and its activities. Students show pride in the program — it is evident that the students are also looking for positive results, not just recognition.	

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Section 2

Best Practices

Program Development and Marketing

Local Advisory Input

Traditionally, the implementation and development of an advisory board for local agricultural education programs have been a significant part of successful programs. The presence alone of an advisory board is typically insufficient for the programmatic and visioning activities that a program requires. The Oley Valley Agricultural Education program utilizes a very effective and active advisory group. The Agriculture Advisory Board consist of 12 to 15 people who represent a cross-section of school, community, parents, and alumni of the program. The diversity of the Board assists in providing a greater representation from the community.

The Advisory Board serves as a very important, decision-making group for the Oley Valley program. The implementation of new curriculum and programmatic changes are approved through the Advisory Board. The Board also serves as an advocate for the program, and assists in representing the views of the program to the community and the school board.

The importance of the Advisory Board was evident through discussions with several of the community businesses. As indicated by the members of the community, a strength has developed over time as a result of using former graduates as members of the Board, who now work or own businesses in the community. This has increased the involvement and interest of the members of the Advisory Board as a result of their personal experiences.

Of the many activities of the Advisory Board, changing the curriculum and programs that were offered at the high school is a significant example of the successful vision of the Board. Through a needs assessment of the community and the Advisory Board representation of the community's interests, the Board makes recommendations, as needed, in the curriculum areas to meet students' needs.

The process is the truest way to market and research the needs of the students and the community, and to successfully deliver a program for meeting those needs. This success has increased enrollment from 30 students to over 160 who are registered for next year's classes. The fundamental aspects of this change were the leadership and guidance of the Advisory Board.

Promoting New Initiatives

Over the past ten years, the adoption and development of new initiatives has created a very positive influence on the elements of agricultural education. Numerous innovations and initiatives have and continue to impact education and educational reform. The Oley Valley School District and the Agricultural Education program have worked to promote and create opportunities for students through the adoption of many new initiatives. Some of the initiatives that involve the Oley Valley program include:

- High Schools that Work Program — Oley Valley High School is involved in the Southern Region Education Board (SREB) High Schools that Work program. This agriculture program has been a leader in promoting and implementing the key principles of the initiative. Involvement in the High Schools that Work program has been an exciting point of development for the activities that currently exist. This is a program that focuses on the ten key goals. Based on a national study, students must have higher levels of science and mathematics in order to be successful in today's workforce.

  The Oley Valley School District has given presentations at the SREB meetings on the successes of the programs which have been developed. The career preparation and awareness throughout the curriculum in agricultural education have brought about an exciting opportunity to be involved with this new initiative.
- Tech Prep Program — Through the leadership within the school district, a Tech Prep program has been implemented to raise the standards of applied mathematics, science, and communication. This program has replaced all general courses in science and mathematics, and provided an opportunity for students to articulate their course work with community colleges in the area.

- School to Work Plan — The development of the School to Work plan at the Oley Valley School District involves the elements of the Agricultural Education program and the leadership of the Agriculture Advisory Board. Business and career shadowing and experiences are planned for the students throughout their high school education. In addition, the School to Work plan encourages an ongoing commitment toward career awareness and skill development.
- Integration of Agriculture and Science (Agriscience-based Instruction) — The development of a curriculum that provides a sound educational experience in the science-based areas has impacted the student involvement at Oley Valley. Examples include the offering of agricultural science courses for science credit and the classification of two courses as college preparation. Students who are pursuing strong, science-based career paths are encouraged to supplement the courses offered in the Agricultural Education program by taking additional science courses.

  Courses such as plant science (horticulture), advanced animal science, environmental science, agriculture biology, as well as the elements of other courses, have a strong foundation in science, agriculture literacy, and skill development. Students explore hands-on laboratory activities by working with aquaculture, ostriches, wildlife, environmental science, natural resource management, and tissue culture.

Classroom and Laboratory Instruction

Effective Teaching Techniques

The Oley Valley Agricultural Education program has a solid reputation throughout the community and the school as a rigorous, science-based program. The courses are taught via a practical, hands-on approach that facilitates the learning and retention process. Although these courses depict a strong academic component and high expectations for the students, the teaching techniques maintain a student-centered focus through patience, extra time when needed, and an attitude reflecting a strong belief in the students.

The Agricultural Education program has been modernized, diversified, and changed to meet today's needs. The effective teaching strategies include using current techniques such as hydroponics, aquaculture, and diversified products (e.g., ostrich eggs, alligator meat, Japanese quail). Parents commend the instructors on their ability to push the program to its fullest potential. Many students emphasized that the teachers make the learning process a fun and enjoyable experience. The FFA Chapter also compliments the Agricultural Education program because it teaches responsibility, team work, and diligence. David Miller, a school board member, commented "FFA helps students live life better because they learn to give back to the community. It helps them make better choices and is a guide for what they will do for the rest of their lives."

Each instructional unit taught has a section that deals with related career opportunities. Students become aware of the broad careers available and can develop the skills needed to pursue those careers and further education. As a result, most graduates of the program pursue further education. In addition, many students return to Oley Valley and are employed in local agriculture-related businesses.

Agriculture Literacy

Students at Oley Valley High School, who pursue an agricultural education, tend to have a basic interest in science. The Agricultural Education program also helps the students understand the vastness of the agriculture industry and the opportunities available. The agricultural biology courses emphasize food science, plants, and animals in a hands-on contextual approach. In addition, several field trips are included in the course so students can observe first hand the operation of agriculture-related businesses. The students gain an appreciation for the sophistication of a production farm operation and of the skills required to be successful. Students can take this course as an elective to meet the requirements for biology.

Dr. James Howe and Mr. Jeremy Deysher meet with the parents of incoming, eighth-grade students to provide an overview of the program and update their perspective of the expanding opportunities in agriculture. They also meet with each eighth-grade student to inform them about the courses that are offered in agricultural education. Both teachers are very student oriented, caring, and personable. As a result, they have been very successful in recruiting students and increasing enrollment.

The application of science is the basis of these agricultural education courses. This basis combined with the availability of two college-prep courses (agricultural biology and advanced animal science) have

been major factors in overcoming a negative, traditional "cows and plows" stereotype of the program. Students, school officials, and the community recognize these agricultural courses as rigorous and beneficial to the students as they pursue further education.

Building Partnerships and Mobilizing Volunteers

Teacher as Manager

At Oley Valley, the instructor is the catalyst for the active participation of local businesses, parents, alumni, and school administrators. This teacher-as-manager role is effective in helping the students establish basic competency, implement project-based applications, and integrate important work skills. The Oley Valley program also includes the active involvement of parents; local businesses and industry; school administrators; the school board; and a dynamic FFA Chapter led by the students. Upon seeing the program's benefits to the students and the community, school administrators and community members have provided support by obtaining supplies, planning events, marketing the program, securing equipment, and offering moral support.

Proactive Participation

Local businesses and industry, parents, and school administrators are all active participants in the Agriculture Advisory Board. While the instructor is central to this Board, local advisors participate proactively and focus on local needs and concerns. Information is also provided to the community through the District's newsletter.

Students, parents, local businesses, and administrators are attracted to the Agricultural Education program because of the success of its students and the dedication of its instructors. The students also demonstrate an ownership to the program by maintaining and caring for the facility, and by showing their pride in the quality of their program.

The Agricultural Education program encourages proactive participation by conducting various activities such as presentations to middle school students. The Agriculture Advisory Board is representative of the local community and has accessibility to the program. The program builds the basis for various career opportunities for the students, including further education. In addition, the Agricultural Education program's value and quality facilitates proactive participation of adults in the community.

Work Based Learning

Supervised Agricultural Experience

Supervised Agricultural Experiences (SAEs) are a work-based education that allows students to gain employability skills by placing them in real-life situations. Students who participate in a SAE program must be currently enrolled in an agriculture education course.

Oley Valley High School's Agricultural Science program utilizes SAEs as a way of connecting a student's career objective with classroom instruction and hands-on, real-world experience. This work-based learning approach affords students the opportunity to explore various career options. Since this experience is gained during their high school education, the students are also better prepared, upon graduation, to succeed in today's workforce or pursue post-secondary education. The emphasis for student involvement is based on their career objectives. Students with an agriculture career objective are encouraged to participate in the program.

Dr. James Howe manages the SAE program by offering an individualized approach that assists students in custom designing their programs. SAEs are credit offerings which do not occur during regularly-scheduled class periods. Instead, students participate in the program after regular school hours or during school hours at prearranged times, determined in consultation with the agriculture instructor. SAEs may be integrated into the students' regularly-scheduled courses to utilize the agriculture laboratory facilities, but currently, they do not take place during regularly-scheduled class time.

Some students choose entrepreneurial experiences, while others choose on-the-job training with local businesses or agriscience research projects. SAEs may take place at the student's home, a local business, or in the school's agriculture education facilities. The type of experience is based primarily on the student's career objective. Teachers serve as career advisors to help students identify their interests and advise them on the types of SAEs available. This teacher-as-manager method enables the students to

direct their own future career plans, thereby instilling a sense of ownership in the student.

Considerable emphasis is placed on the importance of relating what the student learns in the classroom to real-world experiences. Students rate their SAEs very high in its effectiveness of relating back to the classroom experience. The students' career objectives and SAE programs are often supplemented by FFA career development events in related areas. Former students have identified their success in the workforce as being strongly related to the SAE programs which they conducted during high school.

Section 3

Information

Classroom and Laboratory Instruction

Project Based Instruction

The Oley Valley School District program offers students an opportunity for practicing skills and knowledge, and applying those skills in real-life, oriented settings. Projects incorporate mathematics, science, business, and safety within the context of the real world. Students can observe the value of what they learn in a contextual manner.

Developing projects based on real-life (workplace) expectations and local industry needs are essential to the success of the program and student achievement. The use of technology and other resources within the school and the community are important to the development of skills, knowledge, and real-world applications for student projects.

Work Based Learning

Career Exploration

Emphasis on career exploration is evident as a component of all regularly-scheduled course offerings as well as the SAE program. Although career exploration does not appear to be an organized effort in elementary or middle school, it is very evident in the agriculture program delivery. Efforts to connect with school-to-work and tech-prep programs are also evident. The program has a reputation in the community for providing a relevant and practical education for students.

Student Leadership and Personal Development

Teacher as Manager: Results vs. Recognition

The Oley Valley School District program is successful due to the student leadership of the Agricultural Education program and its activities. Students show pride in the program — it is evident that the students are also looking for positive results, not just recognition.

The agricultural education instructors at Oley Valley have instilled a sense of ownership in their students regarding the Agricultural Education program. This ownership creates an opportunity for students to accept responsibility for leadership activities and events, while providing a unique opportunity for leadership development — experiencing leadership.

The strong self images and confidence that the students exhibited during the survey visit is indicative of the leadership skills which these students have acquired. Students take responsibility for their leadership development and truly understand what is expected of them. In addition, the students express a genuine level of support from the agriculture instructors, which allows the students to take risks and try new opportunities. Clearly, the instructors provide students with encouragement to reach their goals, as well as the resources to accomplish those goals.

Comments made by students regarding their leadership experiences include:

- "The Agriculture Education program at Oley Valley High School belongs to the students and the community."
- "Coming to Oley Valley was the best thing I ever did for my future."
- "They (the advisors) show us the options, but let us make the decisions."

Appendix A

Table of Acronyms

Acronym	Definition
BMP	Best Manufacturing Practices
LPS	Local Program Success
SAE	Supervised Agricultural Experience
SREB	Southern Region Education Board

Appendix B

Survey Team

Team Member	Activity	Function
Joyce Winterton, Ph.D. (703) 360-3600	**National FFA** **Partner Development Team** Alexandria, VA	**Team Chairman**
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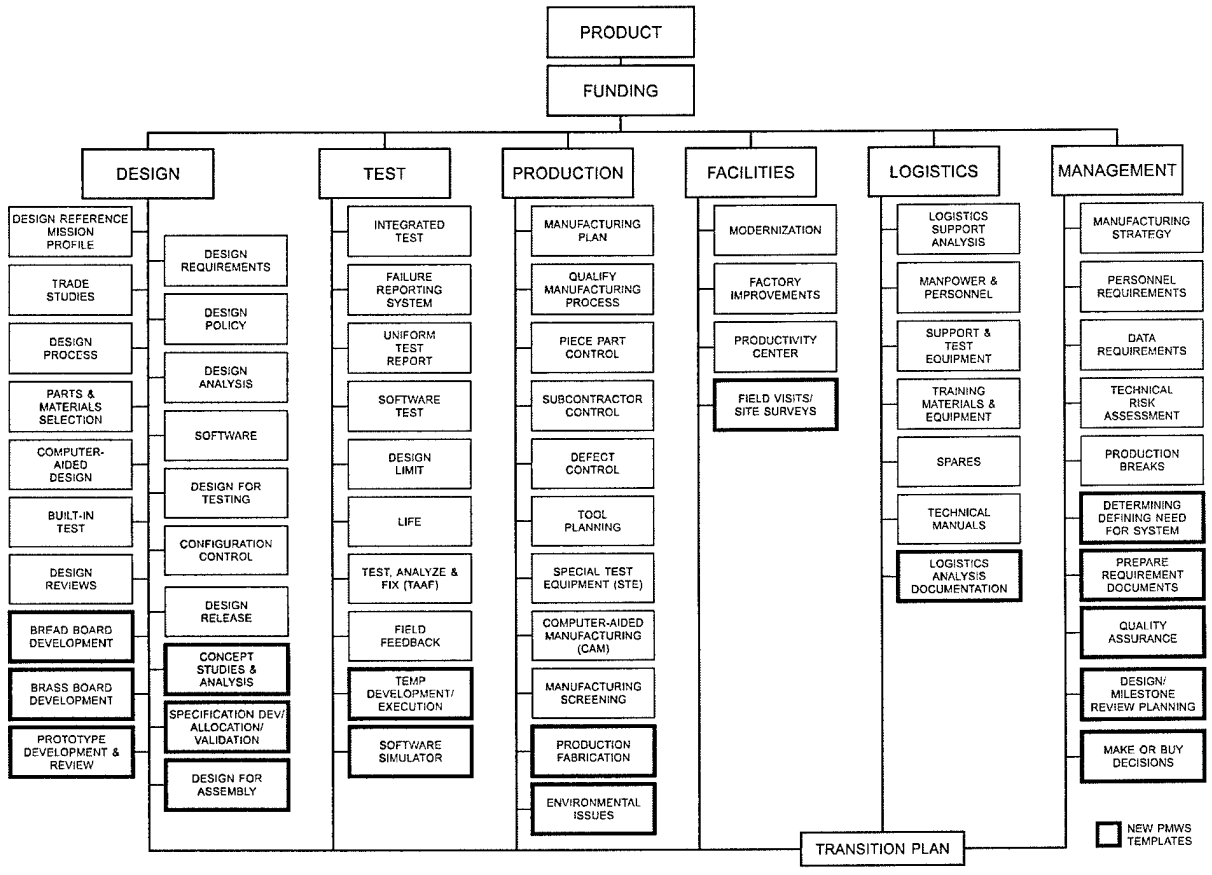
Appendix C

Critical Path Templates and BMP Templates

This survey was structured around and concentrated on the functional areas of design, test, production, facilities, logistics, and management as presented in the Department of Defense 4245.7-M, *Transition from Development to Production* document. This publication defines the proper tools—or templates—that constitute the critical path for a successful material acquisition program. It describes techniques for improving the acquisition process by addressing it as an *industrial* process that focuses on the product's design, test, and production phases which are interrelated and interdependent disciplines.

The BMP program has continued to build on this knowledge base by developing 17 new templates that complement the existing DOD 4245.7-M templates. These BMP templates address new or emerging technologies and processes.

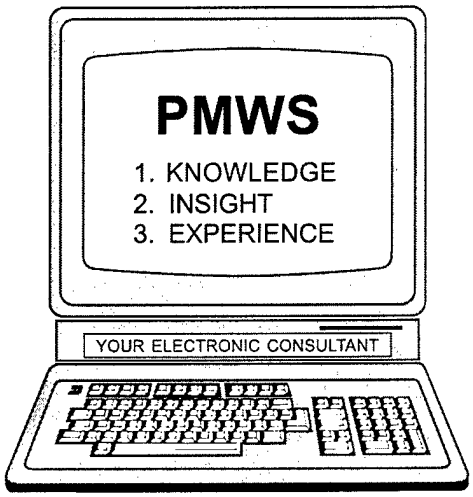
"CRITICAL PATH TEMPLATES FOR TRANSITION FROM DEVELOPMENT TO PRODUCTION"



Appendix D

BMPnet and the Program Manager's WorkStation

The BMPnet, located at the Best Manufacturing Practices Center of Excellence (BMPCOE) in College Park, Maryland, supports several communication features. These features include the Program Manager's WorkStation (**PMWS**), electronic mail and file transfer capabilities, as well as access to Special Interest Groups (SIGs) for specific topic information and communication. The BMPnet can be accessed through the World Wide Web (at http://www.bmpcoe.org), through free software that connects directly over the Internet or through a modem. The PMWS software is also available on CD-ROM.



PMWS provides users with timely acquisition and engineering information through a series of interrelated software environments and knowledge-based packages. The main components of PMWS are KnowHow, SpecRite, the Technical Risk Identification and Mitigation System (TRIMS), and the BMP Database.

KnowHow is an intelligent, automated program that provides rapid access to information through an intelligent search capability. Information currently available in KnowHow handbooks includes Acquisition Streamlining, Non-Development Items, Value Engineering, NAVSO P-6071 (Best Practices Manual), MIL-STD-2167/2168 and the DoD 5000 series documents. KnowHow cuts document search time by 95%, providing critical, user-specific information in under three minutes.

SpecRite is a performance specification generator based on expert knowledge from all uniformed services. This program guides acquisition personnel in creating specifications for their requirements, and is structured for the build/approval process. SpecRite's knowledge-based guidance and assistance structure is modular, flexible, and provides output in MIL-STD 961D format in the form of editable WordPerfect® files.

TRIMS, based on DoD 4245.7-M (the transition templates), NAVSO P-6071, and DoD 5000 event-oriented acquisition, helps the user identify and rank a program's high-risk areas. By helping the user conduct a full range of risk assessments throughout the acquisition process, TRIMS highlights areas where corrective action can be initiated before risks develop into problems. It also helps users track key project documentation from concept through production including goals, responsible personnel, and next action dates for future activities.

The **BMP Database** contains proven best practices from industry, government, and the academic communities. These best practices are in the areas of design, test, production, facilities, management, and logistics. Each practice has been observed, verified, and documented by a team of government experts during BMP surveys.

Access to the BMPnet through dial-in or on Internet requires a special modem program. This program can be obtained by calling the BMPnet Help Desk at (301) 403-8179 or it can be downloaded from the World Wide Web at http://www.bmpcoe.org. To receive a user/e-mail account on the BMPnet, send a request to helpdesk@bmpcoe.org.

Appendix E

Best Manufacturing Practices Satellite Centers

There are currently seven Best Manufacturing Practices (BMP) satellite centers that provide representation for and awareness of the BMP program to regional industry, government and academic institutions. The centers also promote the use of BMP with regional Manufacturing Technology Centers. Regional manufacturers can take advantage of the BMP satellite centers to help resolve problems, as the centers host informative, one-day regional workshops that focus on specific technical issues.

Center representatives also conduct BMP lectures at regional colleges and universities; maintain lists of experts who are potential survey team members; provide team member training; identify regional experts for inclusion in the BMPnet SIG e-mail; and train regional personnel in the use of BMP resources such as the BMPnet.

The seven BMP satellite centers include:

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Appendix F

Navy Manufacturing Technology Centers of Excellence

The Navy Manufacturing Sciences and Technology Program established the following Centers of Excellence (COEs) to provide focal points for the development and technology transfer of new manufacturing processes and equipment in a cooperative environment with industry, academia, and Navy centers and laboratories. These COEs are consortium-structured for industry, academia, and government involvement in developing and implementing technologies. Each COE has a designated point of contact listed below with the individual COE information.

Best Manufacturing Practices Center of Excellence

The Best Manufacturing Practices Center of Excellence (BMPCOE) provides a national resource to identify and promote exemplary manufacturing and business practices and to disseminate this information to the U.S. Industrial Base. The BMPCOE was established by the Navy's BMP program, Department of Commerce's National Institute of Standards and Technology, and the University of Maryland at College Park, Maryland. The BMPCOE improves the use of existing technology, promotes the introduction of improved technologies, and provides non-competitive means to address common problems, and has become a significant factor in countering foreign competition.

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Center of Excellence for Composites Manufacturing Technology

The Center of Excellence for Composites Manufacturing Technology (CECMT) provides a national resource for the development and dissemination of composites manufacturing technology to defense contractors and subcontractors. The CECMT is managed by the GreatLakes Composites Consortium and represents a collaborative effort among industry, academia, and government to develop, evaluate, demonstrate, and test composites manufacturing technologies. The technical work is problem-driven to reflect current and future Navy needs in the composites industrial community.

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rfglcc@glcc.org

Electronics Manufacturing Productivity Facility

The Electronics Manufacturing Productivity Facility (EMPF) identifies, develops, and transfers innovative electronics manufacturing processes to domestic firms in support of the manufacture of affordable military systems. The EMPF operates as a consortium comprised of industry, university, and government participants, led by the American Competitiveness Institute under a CRADA with the Navy.

Point of Contact:
Mr. Alan Criswell
Electronics Manufacturing Productivity Facility
Plymouth Executive Campus
Bldg 630, Suite 100
630 West Germantown Pike
Plymouth Meeting, PA 19462
(610) 832-8800
FAX: (610) 832-8810
http://www.engriupui.edu/empf/

National Center for Excellence in Metalworking Technology

The National Center for Excellence in Metalworking Technology (NCEMT) provides a national center for the development, dissemination, and implementation of advanced technologies for metalworking products and processes. The NCEMT, operated by Concurrent Technologies Corporation, helps the Navy and defense contractors improve

manufacturing productivity and part reliability through development, deployment, training, and education for advanced metalworking technologies.

Point of Contact:
Mr. Richard Henry
National Center for Excellence in Metalworking Technology
1450 Scalp Avenue
Johnstown, PA 15904-3374
(814) 269-2532
FAX: (814) 269-2799
henry@ctc.com

Navy Joining Center

The Navy Joining Center (NJC) is operated by the Edison Welding Institute and provides a national resource for the development of materials joining expertise and the deployment of emerging manufacturing technologies to Navy contractors, subcontractors, and other activities. The NJC works with the Navy to determine and evaluate joining technology requirements and conduct technology development and deployment projects to address these issues.

Point of Contact:
Mr. David P. Edmonds
Navy Joining Center
1100 Kinnear Road
Columbus, OH 43212-1161
(614) 487-5825
FAX: (614) 486-9528
dave_edmonds@ewi.org

Energetics Manufacturing Technology Center

The Energetics Manufacturing Technology Center (EMTC) addresses unique manufacturing processes and problems of the energetics industrial base to ensure the availability of affordable, quality energetics. The focus of the EMTC is on process technology with a goal of reducing manufacturing costs while improving product quality and reliability. The COE also maintains a goal of development and implementation of environmentally benign energetics manufacturing processes.

Point of Contact:
Mr. John Brough
Energetics Manufacturing Technology Center
Indian Head Division
Naval Surface Warfare Center
Indian Head, MD 20640-5035
(301) 743-4417
DSN: 354-4417
FAX: (301) 743-4187
mt@command.nosih.sea06.navy.mil

Manufacturing Science and Advanced Materials Processing Institute

The Manufacturing Science and Advanced Materials Processing Institute (MS&AMPI) is comprised of three centers including the National Center for Advanced Drivetrain Technologies (NCADT), The Surface Engineering Manufacturing Technology Center (SEMTC), and the Laser Applications Research Center (LaserARC). These centers are located at The Pennsylvania State University's Applied Research Laboratory. Each center is highlighted below.

Point of Contact for MS&AMPI:
Mr. Henry Watson
Manufacturing Science and Advanced Materials Processing Institute
ARL Penn State
P.O. Box 30
State College, PA 16804-0030
(814) 865-6345
FAX: (814) 863-1183
hew2@psu.edu

- **National Center for Advanced Drivetrain Technologies**
  The NCADT supports DoD by strengthening, revitalizing, and enhancing the technological capabilities of the U.S. gear and transmission industry. It provides a site for neutral testing to verify accuracy and performance of gear and transmission components.

  Point of Contact for NCADT:
  Dr. Suren Rao
  NCADT/Drivetrain Center
  ARL Penn State
  P.O. Box 30
  State College, PA 16804-0030
  (814) 865-3537
  FAX: (814) 863-6185
  http://www.arl.psu.edu/drivetrain_center.html/

- **Surface Engineering Manufacturing Technology Center**

  The SEMTC enables technology development in surface engineering—the systematic and rational modification of material surfaces to provide desirable material characteristics and performance. This can be implemented for complex optical, electrical, chemical, and mechanical functions or products that affect the cost, operation, maintainability, and reliability of weapon systems.

  Point of Contact for SEMTC:
  Dr. Maurice F. Amateau
  SEMTC/Surface Engineering Center
  P.O. Box 30
  State College, PA 16804-0030
  (814) 863-4214
  FAX: (814) 863-0006
  http://www/arl.psu.edu/divisions/arl_org.html

- **Laser Applications Research Center**

  The LaserARC is established to expand the technical capabilities of DOD by providing access to high-power industrial lasers for advanced material processing applications. LaserARC offers basic and applied research in laser-material interaction, process development, sensor technologies, and corresponding demonstrations of developed applications.

  Point of Contact for LaserARC:
  Mr. Paul Denney
  Laser Center
  ARL Penn State
  P.O. Box 30
  State College, PA 16804-0030
  (814) 865-2934
  FAX: (814) 863-1183
  http://www/arl.psu.edu/divisions/arl_org.html

Gulf Coast Region Maritime Technology Center

The Gulf Coast Region Maritime Technology Center (GCRMTC) is located at the University of New Orleans and will focus primarily on product developments in support of the U.S. shipbuilding industry. A sister site at Lamar University in Orange, Texas will focus on process improvements.

Point of Contact:
Dr. John Crisp
Gulf Coast Region Maritime Technology Center
University of New Orleans
Room N-212
New Orleans, LA 70148
(504) 286-3871
FAX: (504) 286-3898

Appendix G

Completed Surveys

As of this publication, 92 surveys have been conducted and published by BMP at the companies listed below. Copies of older survey reports may be obtained through DTIC or by accessing the BMPnet. Requests for copies of recent survey reports or inquiries regarding the BMPnet may be directed to:

Best Manufacturing Practices Program
4321 Hartwick Rd., Suite 400
College Park, MD 20740
Attn: Mr. Ernie Renner, Director
Telephone: 1-800-789-4267
FAX: (301) 403-8180
ernie@bmpcoe.org

1985	Litton Guidance & Control Systems Division - Woodland Hills, CA
1986	Honeywell, Incorporated Undersea Systems Division - Hopkins, MN (Alliant TechSystems, Inc.) Texas Instruments Defense Systems & Electronics Group - Lewisville, TX General Dynamics Pomona Division - Pomona, CA Harris Corporation Government Support Systems Division - Syosset, NY IBM Corporation Federal Systems Division - Owego, NY Control Data Corporation Government Systems Division - Minneapolis, MN
1987	Hughes Aircraft Company Radar Systems Group - Los Angeles, CA ITT Avionics Division - Clifton, NJ Rockwell International Corporation Collins Defense Communications - Cedar Rapids, IA UNISYS Computer Systems Division - St. Paul, MN (Paramax)
1988	Motorola Government Electronics Group - Scottsdale, AZ General Dynamics Fort Worth Division - Fort Worth, TX Texas Instruments Defense Systems & Electronics Group - Dallas, TX Hughes Aircraft Company Missile Systems Group - Tucson, AZ Bell Helicopter Textron, Inc. - Fort Worth, TX Litton Data Systems Division - Van Nuys, CA GTE C^3 Systems Sector - Needham Heights, MA
1989	McDonnell-Douglas Corporation McDonnell Aircraft Company - St. Louis, MO Northrop Corporation Aircraft Division - Hawthorne, CA Litton Applied Technology Division - San Jose, CA Litton Amecom Division - College Park, MD Standard Industries - LaMirada, CA Engineered Circuit Research, Incorporated - Milpitas, CA Teledyne Industries Incorporated Electronics Division - Newbury Park, CA Lockheed Aeronautical Systems Company - Marietta, GA Lockheed Corporation Missile Systems Division - Sunnyvale, CA Westinghouse Electronic Systems Group - Baltimore, MD General Electric Naval & Drive Turbine Systems - Fitchburg, MA Rockwell International Corporation Autonetics Electronics Systems - Anaheim, CA TRICOR Systems, Incorporated - Elgin, IL
1990	Hughes Aircraft Company Ground Systems Group - Fullerton, CA TRW Military Electronics and Avionics Division - San Diego, CA MechTronics of Arizona, Inc. - Phoenix, AZ Boeing Aerospace & Electronics - Corinth, TX Technology Matrix Consortium - Traverse City, MI Textron Lycoming - Stratford, CT

1991	*Resurvey of Litton Guidance & Control Systems Division* - Woodland Hills, CA
	Norden Systems, Inc. - Norwalk, CT
	Naval Avionics Center - Indianapolis, IN
	United Electric Controls - Watertown, MA
	Kurt Manufacturing Co. - Minneapolis, MN
	MagneTek Defense Systems - Anaheim, CA
	Raytheon Missile Systems Division - Andover, MA
	AT&T Federal Systems Advanced Technologies and AT&T Bell Laboratories - Greensboro, NC and Whippany, NJ
	Resurvey of Texas Instruments Defense Systems & Electronics Group - Lewisville, TX
1992	Tandem Computers - Cupertino, CA
	Charleston Naval Shipyard - Charleston, SC
	Conax Florida Corporation - St. Petersburg, FL
	Texas Instruments Semiconductor Group Military Products - Midland, TX
	Hewlett-Packard Palo Alto Fabrication Center - Palo Alto, CA
	Watervliet U.S. Army Arsenal - Watervliet, NY
	Digital Equipment Company Enclosures Business - Westfield, MA and Maynard, MA
	Computing Devices International - Minneapolis, MN
	(Resurvey of Control Data Corporation Government Systems Division)
	Naval Aviation Depot Naval Air Station - Pensacola, FL
1993	NASA Marshall Space Flight Center - Huntsville, AL
	Naval Aviation Depot Naval Air Station - Jacksonville, FL
	Department of Energy Oak Ridge Facilities (Operated by Martin Marietta Energy Systems, Inc.) - Oak Ridge, TN
	McDonnell Douglas Aerospace - Huntington Beach, CA
	Crane Division Naval Surface Warfare Center - Crane, IN and Louisville, KY
	Philadelphia Naval Shipyard - Philadelphia, PA
	R. J. Reynolds Tobacco Company - Winston-Salem, NC
	Crystal Gateway Marriott Hotel - Arlington, VA
	Hamilton Standard Electronic Manufacturing Facility - Farmington, CT
	Alpha Industries, Inc. - Methuen, MA
1994	Harris Semiconductor - Melbourne, FL
	United Defense, L.P. Ground Systems Division - San Jose, CA
	Naval Undersea Warfare Center Division Keyport - Keyport, WA
	Mason & Hanger - Silas Mason Co., Inc. - Middletown, IA
	Kaiser Electronics - San Jose, CA
	U.S. Army Combat Systems Test Activity - Aberdeen, MD
	Stafford County Public Schools - Stafford County, VA
1995	Sandia National Laboratories - Albuquerque, NM
	Rockwell Defense Electronics Collins Avionics & Communications Division - Cedar Rapids, IA
	(Resurvey of Rockwell International Corporation Collins Defense Communications)
	Lockheed Martin Electronics & Missiles - Orlando, FL
	McDonnell Douglas Aerospace (St. Louis) - St. Louis, MO
	(Resurvey of McDonnell-Douglas Corporation McDonnell Aircraft Company)
	Dayton Parts, Inc. - Harrisburg, PA
	Wainwright Industries - St. Peters, MO
	Lockheed Martin Tactical Aircraft Systems - Fort Worth, TX
	(Resurvey of General Dynamics Fort Worth Division)
	Lockheed Martin Government Electronic Systems - Moorestown, NJ
	Sacramento Manufacturing and Services Division - Sacramento, CA
	JLG Industries, Inc. - McConnellsburg, PA
1996	City of Chattanooga - Chattanooga, TN
	Mason & Hanger Corporation - Pantex Plant - Amarillo, TX
	Nascote Industries, Inc. - Nashville, IL
	Weirton Steel Corporation - Weirton, WV
	NASA Kennedy Space Center - Cape Canaveral, FL
	Department of Energy, Oak Ridge Operations - Oak Ridge, TN

1997	Headquarters, U.S. Army Industrial Operations Command - Rock Island, IL SAE International and Performance Review Institute - Warrendale, PA Polaroid Corporation - Waltham, MA Cincinnati Milacron, Inc. - Cincinnati, OH Oley Valley School District - Oley, PA