CHAPTER 1

The Navy's Environmental Restoration Program: A Brief History

In order to ensure military readiness and environmental quality, the DON established the Environmental Restoration program, which includes the Installation Restoration (IR) program and the Base Realignment and Closure program (BRAC). The program combines aggressive cleanup policies with modern technology to restore and preserve property under Navy/Marine Corps stewardship. Environmental cleanup initiatives are engineered to work effectively without impairing the ability to defend our nation.

Superfund Legislation (CERCLA)

Congress passed the Superfund Amendments and Reauthorization Act (SARA) in 1986, bringing all federal facilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) umbrella. As a result of SARA, the Defense Environmental Restoration Program was established. The Defense Environmental Restoration Account was established to fund the clean up sites contaminated with hazardous materials in the past. SARA required the DON to follow Environmental Protection Agency (EPA) guidelines and to have a program that uses the same terminology as Superfund.

Current Funding

To promote flexibility and improve performance, Congress divided the Defense Environmental Restoration Account among the individual Service Components in 1997. The new DON account was designated Environmental Restoration, Navy (ER,N). Funds appropriated by Congress are placed in this account and pay for the Department of Navy's Environmental Restoration Program. The program plan, which is updated annually, documents site cleanups and projects future cleanup goals.

The SMART Cleanup Strategy

The Navy/Marine Corps cleanup program ensures that, in years to come, the Navy will provide a healthy environment for those who work and train on bases or live in nearby communities. An important part of this effort is the preservation of ecosystems on our installations, including regional plants and wildlife on Navy and Marine Corps bases.

What Does S.M.A.R.T. Stand For?

S.M.A.R.T. cleanup **S**aves **M**oney and **A**lleviates **R**isk in a **T**imely manner. The strategy provides guidelines for accomplishing DON Environmental Restoration Program goals, focusing on the three main objectives of reducing risk and saving time and money.

What Does the IR Program Do?

The program identifies, studies and cleans up past hazardous waste disposal sites on Navy and Marine Corps installations in the United States. Our policy for responsible cleanup is based on eight main principles:

- Fully comply with the law
- Act immediately to eliminate human exposure that poses an immediate threat
- Clean up the worst problems first
- Partner with regulators
- Involve local communities
- Don't study—act
- Consider planned land use
- Embrace new technology

SMART Cleanup for a Sustainable Future

DON's target is to have cleanup work completed at all 4500+ sites by the end of fiscal year 2014. Through the Environmental Restoration Program, the DON is performing SMART Cleanup that will make Navy and Marine Corps installations a healthier place for generations to come.

Community Involvement & Partnership

Navy and Marine Corps bases rely on positive support and interaction with surrounding communities in order to operate successfully. As members of the communities in which we live and work, DON installations reach out to our neighbors to secure employee housing, fill civilian workforce jobs, ensure education for our children, and participate in cultural and recreational activities.

Site cleanup projects require a high level of community interaction as well. The Restoration Advisory Boards (RABs) are the major vehicle for community participation in the cleanup process. To assist the community in understanding technical documents pertaining to the cleanup process, the Technical Assistance for Public Participation (TAPP) was instituted.

Restoration Advisory Boards (RABs)

RABs are citizen advisory panels that provide ideas and suggestions for the success of the environmental restoration program at individual bases. Each panel is made of representatives from the community, DoD, EPA, local, tribal and state governmental agencies. Citizens from the community volunteer their time and effort to serve as RAB members. Within the RAB, all members hold equal rank, and meetings are open to the general public. During the meetings, RAB members receive updates on site cleanup progress, and also review and provide comments on remediation plans and documents. RAB members then share this information with constituent groups that are not present at the meeting. Each RAB is structured to meet the community needs of the Environmental Restoration program at individual bases. DON began forming RABs in FY 1994.

How Can I Get Involved in a RAB?

Most installations that have cleanup programs also have established RABs. Closing installations are very likely to have RABs. For more information about forming or participating in a RAB, please contact the Public Affairs Office at your local installation.

The RAB's Coordinator's Vision

The strength of RABS as advisory bodies is their diversity and their ability to apply common sense to issues that contain technical terminology and procedures. Over the years, RAB members have provided numerous constructive ideas that have lead to better cleanup solutions with less harm to the environment. In this new millennium, as we bring the cleanup program to an end, Navy's interaction with RAB members will become more and more important.

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RAB Members, we extend a sincere "Thank You" for your hard work and many excellent suggestions. The Department of Navy appreciates your efforts!

RAB Success Story

Phytoremediation Used for Groundwater Cleanup NUWC Keyport, EFD Northwest

Groundwater cleanup site, Operable Unit 1

Naval Undersea Warfare Center (NUWC) Keyport, located at Keyport, Washington, was established in 1913. The center routinely performs maintenance and repair work on underwater weapons. However, NUWC Keyport has recently taken a new tack—it has launched a battle against underground water pollution on its property.

VOC Contamination

NUWC Keyport has a landfill on site. Past disposal of volatile organic compounds (VOCs), primarily trichloroethylene and its breakdown products, led to groundwater contamination at NUWC Keyport. It was crucial for the Navy to control and contain these substances to ensure that they did not migrate off the property.

A Tree-mendous Idea

Traditional control methods involve pumping out the groundwater and treating it to remove contaminants, but the Keyport Restoration Advisory Board (RAB) suggested a different approach. The RAB, comprised of Navy, community, federal, state and tribal representatives, recommended that the Navy try phytoremediation. Phytoremediation depends on trees to do the cleanup work—the trees draw up contaminated water through their roots and convert the contaminants to safe substances. The method sounded good to the Navy and their cleanup consultants, so they proceeded with a plan to implement phytoremediation as part of the landfill VOC remediation.

The plan called for planting 1,000 hybrid poplar trees over two one-acre "hot spots" of groundwater contamination. According to Michael Meyer, project manager for the consulting company, the type of hybrid poplar selected is ideal for this type of project. Like a living chemistry lab, the hybrid can convert VOCs to harmless carbon dioxide, chloride and water. Since the trees naturally perform their job of cleaning up the contamination, long-term maintenance of the remedy will be minimal. The hybrid was developed at Washington State University and has been studied extensively at the University of Washington, where its applications for phytoremediation have been further developed. Expert consultants from the University of Washington were brought on as part of the project team.

Recycling and Monitoring Requirements

The phytoremediation project required more than just planting poplars. The landfill had previously been capped with asphalt, and all 694 tons had to be removed and recycled. Afterward, monitoring wells and instrumentation had to be installed, and the exposed soil beneath the former asphalt cap had to be tilled and covered with planting soil.

Nine Inches to Nine Feet

The planting got underway on Earth Day, April 22, 1999. The poplars arrived in the form of nine-inch hardwood cuttings. These "stick" starts were planted in an array across the remediation site. One advantage of the selected trees is that the poplar hybrids grow extremely fast. "By the end of the first growing season, some were nine feet tall!" said Meyer.

Planting ceremony, April 22,1999

Patience With Poplars

For phytoremediation purposes, the depth of the roots is more important than the height of the tree. So far, the roots of the hybrid poplars at NUWC Keyport have not quite reached the water table. Once the roots extend into the water table, it will be possible for the VOC conversion to begin. According to Sandy Keinholz, Remedial Project Manager (RPM) for Engineering Field Activity Northwest, the poplars should start doing their job some time in the spring of 2001. A long-term monitoring program will track the progress and effectiveness of this natural cleaning process.

Nature's Pump and Treat

Assuming the trees perform as expected, they should have a dramatic effect on groundwater flow and the concentration of contaminants. Kienholz said that each tree, once fully grown, can withdraw up to 30 gallons of groundwater per day and naturally convert the associated contaminants into non-toxic constituents. "It's kind of like a pump and treat without the machinery," she said.

Hybrid poplar "sticks"

Cost Avoidance

Costs for the project are estimated at $1.5 million, which includes five years of operations and maintenance. Meyer said expenses to date have come to about $900,000. The alternative, a conventional pump and treat system with wells, pumps, pipes and monitoring equipment, has been estimated at about $10 million. Thus, this innovative natural remedy should clean up the site at a substantial cost avoidance to the Navy. Use of this technology also acknowledges the advice and contributions of the RAB.

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Technical Assistance for Public Participation (TAPP)

Recognizing the importance of citizen participation in the environmental restoration process, Congress authorized the provision for Technical Assistance for Public Participation (TAPP).

The TAPP program allows community members of a RAB or a Technical Review Committee (TRC) to apply for up to $25,000 per year for technical support to understand the scientific and engineering issues that apply to an installation's environmental restoration activities. TAPP enables community members to obtain objective, independent technical support from the private sector through the use of Government purchase orders.

The Navy is committed to providing RAB members with the necessary tools to understand our highly technical program. Our project teams and the TAPP program have been developed as resources to help local communities. Since our first TAPP in 1997, the Navy has awarded a total of ten TAPPs.
Two websites are available for more information about the TAPP program:

1) ***http://www.erb.navy.mil***

2) ***http://www.dtic.mil/envirodod/rab/pubs.html***

TAPP Awards in FY 2000

In FY 2000, three TAPPs were awarded:

NAS Adak, AK

During FY 2000, NAS Adak received a second TAPP award. This TAPP was provided to enhance the RAB's ability to interpret and understand technical documents to make recommendations on the remedial process. The technical documents include UXO Preliminary Assessment (Volumes I, II, and III); Operable Unit B Draft Site Investigation (Volumes I and II); and Sampling and Analysis Report Long-term monitoring.

Philadelphia Naval Complex, PA

The Philadelphia Naval Complex awarded a TAPP to review a Long-term Monitoring (LTM) Report consisting of 18 wells at Girard Point and a review of an Ecological Risk Assessment Report for IR site 8. This is the first TAPP at the Philadelphia Naval Complex.

Hunters Point Naval Shipyard, CA

Hunters Point Shipyard TAPP was awarded for the technical review of Parcel B Land Use Control Implementation Plan. The review of this document will provide the community an assessment of the implementability of the proposed land use control.

Effective Partnering Fosters Early Transfer

NSA Mid-South, SOUTHDIV

In December 1999, the Navy successfully transferred 1,861 acres of property at Naval Support Activity (NSA) Mid-South to the local Millington, TN community. The transfer was executed prior to full environmental remediation by making use of the early transfer process authorized under CERCLA 120(h)(3)(C). The Navy retained responsibility for completing the necessary cleanup actions, but has reduced maintenance and other ownership costs by at least three years. The local community plans to use the newly acquired property for economic revitalization, and is already marketing the property to prospective industrial companies as an attractive site for new construction.

Background

The former Naval Air Station (NAS) Memphis was operationally closed and realigned into NSA Mid-South under the Defense Base Realignment and Closure (BRAC) act of 1990. The realignment made the northern portion of the former base available for community reutilization.

Community Requests Early Transfer

Site investigations revealed that trichloroethylene (TCE) solvent had contaminated parts of an aquifer lying underneath the base. The random distribution of the solvent contamination, combined with site-specific hydrogeological factors, would limit practical remedy options for the site. Projected timelines for full remediation—from remedy selection through completion—could take over three years, which would have significantly delayed the deed transfer and economic redevelopment of the property. Based on a request from the local community, the Navy initiated an early transfer procedure as authorized under CERCLA. With approval from the Governor of Tennessee, a Covenant Deferral Request (CDR) was developed, outlining the conditions of the transfer including land use restrictions and schedules for all required cleanup. The Navy retained responsibility for the environmental cleanup.

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Public and Regulator Participation

The Tennessee Department of Environment and Conservation (TDEC) and EPA Region IV were closely involved with the development of the CDR from the early stages. The public was involved through public comment periods on the documentation, as well as through the Restoration Advisory Board (RAB). The RAB viewed the early transfer as an opportunity to help revitalize the local economy, and was supportive of the project. To keep the public informed, the Navy published a notice in local newspapers advising the community of Navy's intent to conduct an early transfer. Project issues were discussed at quarterly RAB meetings. The community had a high level of trust that the Navy was committed to completing the cleanup after the property transfer.

Coordination Challenges

Obtaining final approval of the CDR required coordination among several organizations, from both technical and legal perspectives. Coordination among SOUTHDIV, Naval Facilities Engineering Command headquarters, Chief of Naval Operations (CNO), and the Assistant Secretary of the Navy (ASN) was required to ensure that all Navy interests were being addressed. TDEC and EPA Region IV were also closely involved to ensure the state's interests and applicable regulatory requirements were addressed. Multiple drafts of the CDR were required before all involved parties were satisfied. Development of Land Use Control (LUC) language was particularly challenging.

Cost Avoidance

Although the airfield and a number of other facilities were leased to the community after closure, the income derived from the leases did not offset the Navy's ownership costs, such as building and infrastructure maintenance. Through early transfer of the property, NSA Mid-South avoided at least three years of ownership costs.

Project Successes

The Honorable Don Sundquist, Governor of Tennessee, approved the CDR on September 24, 1999. Navy signed the Finding of Suitability to Transfer (FOST) on November 19, 1999, and transfer of the property occurred on December 30, 1999. This was only the second early transfer action of this sort for the Department of the Navy.

Aerial view, NSA Mid-South

The success of the project was largely due to the relationship and trust developed between the Navy, the community, EPA Region IV, and state and local regulators. SOUTHDIV was able to provide the regulators with a level of comfort that the Navy would complete the necessary cleanup following site transfer. The local Millington community can benefit economically from the early transfer, as it provides an opportunity to market the property to prospective industry.

Increased Cooperation Allows Successful Fast Tracking

NAWC Warminster, NORTHDIV

The former Naval Air Warfare Center (NAWC) Westminster consisted of 734 acres, mostly in Warminster Township, Bucks County, Pennsylvania. The installation was commissioned in 1944 as the Naval Air Development Center. It went from designing modifications to military aircraft during World War II to researching, developing, testing, and evaluating Naval aircraft systems, as well as conducting studies in anti-submarine warfare systems and software development. Wastes generated include paints, solvents, industrial wastewater treatment sludge, and waste oils. The activity was placed on the National Priorities List (NPL) in 1987.

BRAC Facility

Under the Base Realignment and Closure (BRAC) program, NAWC Warminster was realigned in 1991. The facility ceased operations in September 1996 and was closed in March 1997. Working with the Federal Lands Reuse Authority (FLRA) and township officials from Warminster and Northampton Townships, as well as Ivyland Borough, the Navy divided the facility into eight parcels. According to the proposed land re-use plan, parcels will be used for residential, commercial, recreational, and industrial uses. By the end of FY 1999, several parcels, which were substantially clean environmentally, had already been transferred. FOST documentation was signed for the majority of remaining parcels by the end of FY 2000, and the final two parcels were transferred by October 15, 2000.

Challenges for Remaining Sites

The aggressive schedule presented unique problems. Many remaining parcels (or their subdivisions, known as phases) contained either IR sites or areas of concern (AOCs). The AOCs were identified during the Environmental Baseline Survey (EBS) as possibly requiring additional investigation or remediation. The IR sites and AOCs had to be addressed before the property could be transferred. Once CERCLA requirements were met, the Navy prepared a Finding of Suitability for Transfer (FOST) for each of the parcels/parcel phases to ensure that it was ready for transfer. AOCs were investigated to assure that contaminant levels, if present, were below the planned or anticipated re-use of the particular parcel in which it was found. Otherwise, the Navy would remove the contamination.

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For a Sustainable Future

Stakeholder Involvement

From the beginning, Navy has worked with EPA Region III and the Pennsylvania Department of Environmental Protection (PADEP), as well as representatives from the United States Geological Survey (USGS) and the surrounding townships and boroughs. This group, known as the Technical Review Committee (TRC), was formed in April 1988 and converted to a Restoration Advisory Board (RAB) in FY 1994 after the facility had been targeted for closure.

Increasing Pressure

Toward the end of FY 1999, pressure to complete all environmental activities at the facility increased significantly as the FLRA stepped up its efforts to find tenants for the existing buildings, or developers for the open spaces. Through interim actions and removals, fieldwork and remediation was nearly complete by this time. Groundwater treatment systems had already been installed for Areas A, C, and D, but OPS (Operating Properly and Successfully) determination had yet to be done. Though much work had been accomplished since the activity had been placed on the National Priority List (NPL) and BRAC lists, a great deal remained to be done prior to finding the property suitable for transfer. Once the target of complete property transfer by the end of FY 2000 had been set, the Navy realized that it needed to interact differently with the other groups to accelerate the time it took to go from a Remedial Investigation (RI) to a FOST.

Greater Participation

It became clear that some of the existing Remedial Project Managers would not allow the new target date to be met. More active participation of upper management was needed. Tier II meetings, as they came to be called, involved active participation of the senior managers from the Navy, EPA and PADEP in the development and tracking of a viable timeline. During the course of the Tier II meetings, the Navy and EPA discovered that they had similar goals. While the Navy was interested in getting FOSTs signed in order to transfer each parcel, EPA was tracking its Construction Completion Date (CCD) for the IR sites. Both of these targets were set for completion by the end of FY 2000 by the respective agencies.

Prioritizing Documentation

While the last parcels/parcel phases were not being transferred until the end of FY 2000, others were targeted for a June 2000 transfer. To facilitate this, Tier II participants prioritized the documentation of parcels/parcel phases according to transfer schedule priority.

A New Approach

The Tier II group also streamlined the report writing/review process. Previously, the Navy would develop a complete deliverable, regulators would provide comments on the deliverable, Navy would integrate the comments and then re-submit the documentation to the regulators to verify that the changes were made. This lengthy process was modified so that the Navy would provide an early rough draft of each document section to regulators as soon as it became available. In this way, the writing and review process would go on simultaneously. Once regulator comments were ready, all parties at the working level would meet to agree on the language changes. The effort was complicated by the fact that (1) OPS had to be demonstrated for each of the groundwater treatments, and (2) a TI (Technical Impracticability) waiver was needed for Area A groundwater.

Similarly, the Navy prepared the Proposed Remedial Action Plan (PRAP) during or just after the Remedial Investigation/Feasibility Study (RI/FS), then worked with the regulators to revise it. During the PRAP comment period, the Navy prepared and the regulators reviewed the Record of Decision (ROD). By the time the comment period ended, the ROD was ready to be issued, with the exception of the responsiveness summary. Once the comment period was over, the responsiveness summary was completed by the Navy, reviewed by the regulators, edited by all, added to the ROD, and sent forward for signature.

As early as the RI or RI/FS stage, the Navy began work on the FOST and its enclosures. The intent was to have the FOST signed concurrently with or shortly after the signing of the ROD. This required the cooperation of all participants, as well as the legal counsels of the various agencies.

Lessons Learned

What became obvious from these efforts was the willingness of all parties to go beyond how each was accustomed to operating in order to meet their aggressive goals. The project is an excellent example of effective partnering at all levels.

Cleanup Awards

Naval Weapons Station Yorktown Wins DoD Environmental Security Award

Use of innovative technologies in the remediation of Naval Weapons Station (NWS) Yorktown's Installation Restoration sites will allow the Navy to realize a cost avoidance of $1.5 to $2.0 million. Of the 11 sites investigated to date, three have used active biological treatment as a cleanup remedy, five are utilizing some form of natural attenuation to address residual contamination, and every site is reestablished with indigenous habitat as part of the restoration strategy. Proactive approaches such as limited sampling, desktop evaluations, and housekeeping activities at Areas of Concern have allowed the station to realize a cost avoidance of approximately $1 million. Previous estimates suggest that $50 million will be necessary to complete cleanup of sites; however, based on the cost of work already completed, the team anticipates a cost avoidance of over $10 million in completing this cleanup.

For these commendable cleanup efforts, NWS Yorktown was recognized as winner of the Secretary of Defense Environmental Security Team Award, as well as Secretary of the Navy (SECNAV) awards in the Environmental Cleanup: Installation and Individual/Team categories. Congratulations to Jeffrey C. Harlow, Richard F. Hoff, and Scott R. Park!

Secretary of the Navy Environmental Cleanup Awards

Each year, the Secretary of the Navy (SECNAV) presents Environmental Cleanup awards to Navy/Marine Corps installations who have done an exceptional job of protecting human health and the environment. The goal is to recognize installations and individuals who have cleaned up identified sites in a timely, cost-efficient and responsive manner. In addition to NWS Yorktown, winners for this year include the following:

Marine Corps Base (MCB) Camp Lejeune: Individual/Team Category

Camp Lejeune collaboratively signed a Land Use Controls Assurance Plan to clean up sites according to land use categories and associated land use controls, thus assuring that remedial solutions protect the human health and the environment. This innovative approach has led to an accelerated process, increased stakeholder involvement, regulatory coordination, and cost avoidance. Implementation of land use controls led to a cost avoidance of approximately $1.3 million at one site alone.

Marine Corps Air Station (MCAS) Cherry Point: Installation Category

The Cherry Point Installation Restoration staff uses creativity and innovation to solve cleanup problems. The Air Station operates 25 product recovery systems. The Restoration Team has promoted the use of cost effective, alternative recovery systems and techniques, which have been responsible for 115,000 gallons of product recovered over the past two years.

Chief of Naval Operations DRUM-E Environmental Cleanup Awards

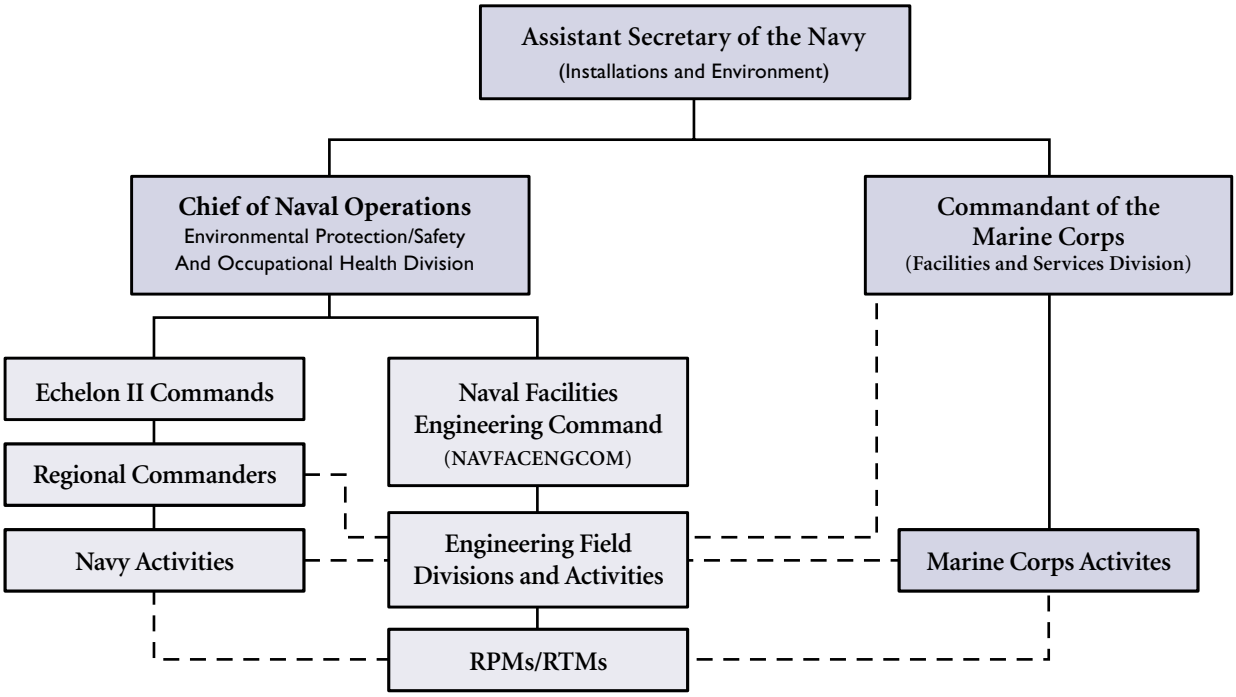
These star performers are the recipients of the FY 2000 "DRUM-E" award for outstanding service to the Installation Restoration program.

From left: David J. Barclift, Northern Division; Karla L. Jenkins, Naval Facilities Engineering Service Center; Mark Craig, Southern Division; Helen Lam, Pacific Division; Richard G. Mach, Jr., Southwest Division; Larry M. Ramos, EFA West; Robert G. Schirmer, Atlantic Division.

Not pictured: Frank P. Zepka, EFA Chesapeake; Mark Murphy, EFA Northwest.

DRUM-E Environmental Cleanup Award

Department of the Navy



NAVFACENGCOM Cleanup Roles

- Environmental Support & Project Execution
- Base Realignment & Closure
- Contracting
- Design and Construction

Engineering Field Divisions and Activities