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HEADQUARTERS

## ENGINEERING & CONSTRUCTION NEWS

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FEBRUARY'S THEME:

# *Engineering & Construction In the Project Delivery Team*

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### DWIGHT'S NOTES

As we've celebrated National Engineers Week, I hope each of you have taken the time to get involved with this great tradition. This year's celebration is of particular note to USACE engineers since it marks a time of renewed emphasis on maintaining our reputation as a world-class engineering organization. Your commanders and civilian senior leaders will be evaluating the "state of the workforce" and will be making decisions on how best to invest in the Corps human capital. You need to participate in those efforts by providing support and advice as this campaign progresses over the next year or so.

We just completed the USACE Board of Directors (BOD) and Strategic Management Review (SMR) this week in HQ. One of the highlights of the BOD, which is chaired by the General Flowers, was the report out by Northwestern Division on the results of their "Capable Workforce" pilot program. NWD performed a systematic review of the workforce in several of its districts to determine how well they were prepared to meet the challenges of their future workload. They found many strengths, but also several weaknesses. With the completion of their pilot study NWD will now begin the hiring, training and other means to maintain their strengths and eliminate their weaknesses. Following their presentation to the BOD, the Chief directed all MSC to perform a similar "Capable Workforce" review. Hats off to General Strock, Dwight Burns, and the NWD team for their leadership in this important endeavor.

While I'm on this theme of Capable Workforce, Jim Johnson, Chief of Planning and Policy in Civil Works Directorate won an endorsement from the BOD to strengthen the planning capability in the Corps. Jim and his team from Institute for Water Resources and USACE field offices concluded their review with recommendations to invest in a comprehensive training and development program, which has great promise. HQ E&C will conduct similar reviews in some key engineering and construction fields in the near future. I need you help in this regard because we will be using the Registry of Skills (ROS) to provide MSC and our study teams with important information about the depth of skills in the Corps. If you have not placed your information in this easy to use database, please do so now. It's voluntary and open and accessible to all USACE employees. You can access ROS on the web by clicking on <https://ros.usace.army.mil:8096/>. Address any questions you may have on this to Ray Navidi in E&C at HQ.

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## DWIGHT'S NOTES (CONTINUED)

Our theme this month is "Engineering and Construction in the Project Delivery Team" (PDT). The key word in this theme is "TEAM". You are a vital part of our PDT's. You lend the team expertise, engineering products, construction management services and a host of other valuable contributions. At times you may serve as technical expert, designer, or even project manager/team leader depending on the needs of the project as defined by the team and the customer. Being a valued member of a PDT requires many skills in addition to your technical expertise. How well you communicate, organize your work, and lead/follow are just as important to the team's success as your engineering and construction knowledge. Please pay attention to these important skills so that you are as competent with them as you are technically. See the articles that follow for more on our theme.

We would also like you to contribute to the final development of the revision to "PM reg" ER 5-1-11, with its new title "U.S. Army Corps of Engineers Business Process." Larry Rogers, Chief, E&C in Fort Worth District, is the project manager for the revised regulation. His team has worked closely with the overall PMBP Program Manager Cynthia Nielson, from HQUSACE. The new ER, I believe, takes the Corps in a sound direction. It aligns project management and quality management processes together under one holistic framework. It also clarifies that project management is a process not an organization, and that a project manager is a role, to be played by the person with the right stuff for a given project, regardless of the "home room" organization they are associated with. Please take a look at the final draft of the ER at [www.hq.usace.army.mil/pmbp/er](http://www.hq.usace.army.mil/pmbp/er). The website will step you through how to get your comments in the system.

We will start our Dam Safety Peer Review next month. Questionnaires will be provided to wide audience. These questionnaires provide valuable documentation to the review team and give the field an opportunity to participate in the review. If contacted I encourage all of you to provide the information requested in a timely manner. In addition to the questionnaire interviews will be conducted in person at four MSC's, at HQUSACE, and by telephone with some others. Remember the answers to the questionnaires or during interviews are confidential.

On last thing: E&C Division is in the process of recruiting for some key vacant positions. We all need top-notch talent in your headquarters to provide the professional leadership the Corps requires. One position, GS-15 Cost Engineering Team Leader is current being advertised. In the near future, you should see email notices as new vacancies are posted (you will have to sign up to receive them automatically, though). In the meantime please keep an eye on the Army CPOC websites to learn about these great opportunities. The duty station for these positions is in the GAO Building in downtown Washington, DC (where all of E&C will be located later this spring). Get in touch with Lisa Rich or Don Dressler if you need additional information.

Essayons,  
Dwight

(Editors' note: If you want to share your thoughts with our readers regarding Dwight's Notes send an email to the E&C News editor ([charles.pearre@usace.army.mil](mailto:charles.pearre@usace.army.mil)). A synopsis of your comments will be published in the next issue.)

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# *Engineering & Construction In the Project Delivery Team*

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## **ENGINEERING & CONSTRUCTION IN THE PROJECT DELIVERY TEAM**

The mission of the Corps of Engineers is to provide quality engineering products and services to military, civil customers, and other agencies consistent with law, policy and regulation. This mission is accomplished by a core of planning, engineering, construction, operation, real estate, project management, and business support functions, integrated through the Project Management Business Process (PMBP). The PMBP reflects the corporate commitment to provide customers with service that is seamless, flexible, effective, and efficient and focuses on the customer's expectations, participation and satisfaction. The project delivery team (PDT) is a vital component of the PMBP and plays a major role providing quality products to customers.

In the past, the management approach to delivering quality products to its customers revolved around cooperative interactions between function oriented (stovepipe) organizations. This approach emphasized stovepipes, allowed management layers by having PM's (project managers) and TM's (technical managers) with often overlapping responsibilities, did not include certain important mission elements, and did not effectively integrate project management. This approach created management redundancies and delays, accountability questions, and did not always produce horizontally integrated products.

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The PDT process acts as union across functional barriers, district, division, and headquarters boundaries to draw on the Corps' strength. A PDT is established in the beginning of each project that consists of a project manager (PM) and technical personnel necessary to develop the project. In some instances, the team also includes local sponsor personnel. All resources are placed under the control of the PM, who has the responsibility of integrating the activities of all members of the team. The strength of the PDT is the organizational relationship, professionalism, effective communication, and diversity of expertise of the team members, and a feeling of mutual respect for each other. It is this strength, demonstrated by unified efforts, which provide quality in the projects and services the Corps delivers to its customers and to the Nation. The PM and functional members share responsibility for project quality. The Engineering and Construction team members are responsible for providing technical support to the PM using their expertise and their best-unbiased judgement. Successful execution of quality projects requires that all functional elements and disciplines work together as one unit.

Engineering and Construction members are is key elements of the project delivery team, at the district, division, and HQUSACE level. The E&C functional chief(s) provides one or more individuals to the PDT to develop the project and designates a "lead engineer or architect" when more than one engineering and construction member are assigned, and empowers them to act on behalf of the their functional division. The lead engineer/architect is responsible for integrating the engineering and construction activities horizontally with all elements of the districts as well as vertically with the PDT team members at the MSC and HQUSACE. The E&C functional element continues to be the key element at all phases of project delivery. Its responsibility begins with the reconnaissance phase and continues through feasibility, design, and construction. Information & services provided by E&C are key to the success of the project delivery.

The success of the PMBP depends to a great extent on the professionalism and expertise of the engineering and construction members of the PDT. To make this a reality, the E&C functional chief(s) in each district, division and at HQUSACE must develop and maintain a professional, technically competent workforce; establish and maintain systems, technical processes and an environment to produce quality products, and provide technical oversight to assure production of quality products and services. At HQUSACE, the E&C Division has recently been reorganized to better execute the PMBP process. The engineering and construction activities of Civil Works and Military Program were combined to eliminate several redundancies.

The E&C element is responsible for producing most of the documents related to project delivery: cost data to reconnaissance report, engineering appendix to feasibility report, design documentation report, engineering documentation report, plans and specifications for construction, operation and maintenance manuals for completed projects, dam safety reports, etc. These documents are vital to the project execution and maintaining quality in the products.

The E&C function chief(s) at each district is responsible for the quality of E&C products. This is achieved by technical coordination, execution, and review of all engineering and construction work. E&C team members of the PDT coordinate engineering activities with appropriate MSC, HQUSACE engineering & construction staff. For analysis of special areas, such as HTRW and hydropower, centers of expertise are used. Independent Technical Review (ITR) is required for all documents produced by in-house labor or by contract. The E&C functional chief(s) forms an ITR team consisting staff not involved in preparation of the documents or from experts from other districts or from private

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consulting firms. Finally, after satisfactory resolution of all comments, the E&C functional chief(s) certify the accuracy and completeness of the product ensuring quality product for customers. In addition to ITR, the E&C functional chief (or chief of construction, if separate from engineering) is responsible for certifying compliance with BCOE requirements. The E&C member of the PDT is responsible for delivering the completed document to PM within time frame agreed upon in the beginning of the project.

The E&C functional chief(s) is required to assure that all technical requirements in documents mentioned above are satisfactorily transformed into quality construction products. This task is accomplished by adequately assuring the contractor's Quality Control system does the necessary quality checks required in the contract.

The following articles tell the stories of the PDT on a Section 205 project in the Walla Walla District, a Work for Others project which was a joint venture between the Mobile and Nashville Districts, and New Orleans District experiences working as a team.

*POC: HARI N. SINGH, CECW-ET, 703-428-6843*

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### **MILL CREEK SECTION 205 PROJECT DELIVERY TEAM**

The 205 project is the bread and butter of many Corps' districts, but for this Walla Walla District Project Delivery Team, the Mill Creek 205 Project was like it was out of the vision that is currently unfolding for the Corps of 2001. It had the elements of a solid process, great people and an intense effort to communicate.

Steve Fink, project manager and civil engineer, leads the Walla Walla District Project Delivery Team that is working with Walla Walla County to construct a flood control project on Mill Creek in Southeastern Washington. Representatives from Engineering, Planning, Real Estate, Office of Council, Programs and Project Management, local sponsor, and landowners comprised this multi-disciplined team. Northwestern Division provided technical advice and quality assurance. Seattle District provided technical advice and independent technical review.

In 1942, the Corps constructed a flood control project on Mill Creek. In 1996, a 70-year event sent floodwaters out of the channel, across private property, down a road and into the Walla Walla Community College campus. Flood fighting efforts returned a portion of the flow back to the Mill Creek channel and the damage was minimized, but there was a need to prevent this from happening in the future.

The options open to the project management team included raising the levee or a more environmentally friendly option, extending the flood control bank and constructing a setback levee. This design would provide 100-year flood protection and would minimize the impacts to the environment, providing protection to lives and property; specifically, to the Walla Walla Community College, Walla Walla County and the city of Walla Walla.

The proposed project includes construction of a 1,689 foot set-back levee in the location where flood waters escaped in 1996; raising 1,100 feet of affected road to pass over the proposed levee; and acquiring real estate easements to maintain the levee.

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The estimated cost of the project is \$700,000 with the federal government paying 65 percent of the cost while the local sponsor pays the other 35 percent. The local sponsor is Walla Walla County and construction is slated to begin later this year.

"The district uses our team as an example of good team cooperation," said Fink. He attributes the following factors to why the team works so well together:

### **Process**

- The project manager worked through Northwestern Division and Seattle District to identify a similar project that had successfully met the requirements. This was provided to the team as a starting point, and helped to define the level of effort that would be needed to be successful.
- The PM developed a rough project schedule that outlined the main components. The team provided input on the products for which they were responsible, and that input was incorporated into the project schedule. This input occurred at one or two initial team meetings so all team members understood their role and the impact their part of the product had on the other team members.
- The team was expanded to include not just the principle product team, but also the sponsor, technical review team, and Northwestern Division and Seattle District support.
- Team members did not change throughout the product development, other than to add members as needed.
- The principle design team directly contributed to the evaluation of alternatives. Selection of the recommended plan was unanimous.
- The team was given the impression that this project was a District priority, not a fill-in project.

### **People**

- Team members were supportive and respectful of one another and aware of each other's roles and their interdependence. There was recognition that what each member did affected the others.
- Team members had a unity of purpose with good communication that was focused, concise, and task oriented. There was an understanding and acceptance of different points of view and ideas.
- The team was comprised of self-starting, dedicated professionals that understood their role in the overall study requirements. This allowed the team to focus on how to best accomplish the project, deliverable within the cost and schedule constraints imposed.
- Some schedule float was included in the project schedule, which was used to absorb unforeseen slippages and changes. This helped the team keep on schedule regarding the overall delivery date, and still allowed flexibility. . The team was able to adjust if someone missed a suspense date.

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## Communication

- Team members had a unity of purpose with good communication that was focused, concise, and task oriented. There was an understanding and acceptance of differing points of view and ideas.
- We had a motivated project sponsor whose point of contact participated in team meetings on a regular basis. This put a face on the customer: We were preparing this product for a person and everyone on the team knew her. This also gave the team a sense of purpose -- this project was going to get constructed!
- The sponsor brought the landowners to the table to discuss their level of support for the project. This helped the landowners to feel as though they were part of the process. It also helped the team identify a preferred alternative that was both technically best and acceptable to the landowners.
- The principle design team members were key participants at a public scoping meeting. This increased team sensitivity towards the public and local landowners who could be impacted by the project.
- The PM communicated all project developments to the team -- sharing with all team members rather than using the "need to know" approach. This prevented hidden agendas.
- The PM was kept informed on information flow between team members. If the economist needed project cost estimates, both the PM and the team cost engineer were informed of that need. The key was that the information flowed through parallel conduits, not stovepipes -- the PM was kept informed but did not get in the way of progress.
- In instances where technical discussions occurred with the sponsor or members of the public, the PM included key team members as appropriate to cover their area of expertise. For issues concerning the flood plain, the Hydrology team member was present to discuss that project aspect; for economics, the economist; and so on in all other project areas.
- The team members did an excellent job of keeping the PM apprised of issues, communications with landowners and the sponsor, schedule impacts etc.
- Using a technical writer as the report lead facilitated product development and insured a quality presentation that met NWW standards.
- The project team knew what the budget was and understood that additional funds would not be available. Each team member "designed to budget" for their particular product piece. The PM retained a small contingency that was used to cover unforeseen cost impacts. This eliminated the trauma of cost overruns, which can be very divisive to team cooperation.

According to Fink, this was not only a model for the District to use as an example of good team cooperation; it was also an enjoyable project delivery team approach.

"Bottom line, it was fun!" said Fink

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## **“VIRTUAL” PROJECT DELIVERY TEAM - A SUCCESSFUL JOINT VENTURE**

A virtual project delivery team was used on a joint venture project between the Mobile and Nashville Districts and two A/E contractors hired by the customer. The virtual team was not initially planned, but evolved out of necessity to insure the successful completion of the project design. The project is the Duck River Dam in Cullman, Alabama. The city of Cullman is the customer. Alternative locations of the project bordered on the boundary of the two districts. However, early studies indicated that the most probable sites for the project would be situated within Nashville District’s boundary. Both districts agreed to turn the project over to Nashville District. Upon completion of detailed Feasibility Studies by the Nashville District, the selected alternative project site was located within Mobile District’s boundary. The two districts met again to discuss the future of the project. It was decided that the two districts had expertise that would complement each other and that the two districts could successfully partner in the preparation of the Engineering Studies Report and the Construction Plans and Specifications. The customer requested local involvement in the design, consequently the customer’s two A/E contractors were added to the design team. All team members agreed that the Nashville District would lead the team during the production of the Engineering Studies Report and that the Mobile District would assume the lead in the subsequent preparation of the Construction Plans and Specifications.

Communication and management of the work would be challenging due to the geographical locations of the two Corps districts and the A/E contractors. Although the telephone would be an essential and major form of communication, other means had to be established to facilitate the timely exchange of memorandums, design data, progress reports, and miscellaneous other project related information, including design drawings. Advancements in personal computer technology made it possible to establish and effectively use a “virtual office”. Setting up the “virtual office” was an evolutionary process with various new methods being used on a trial and error basis.

E-mail was initially used to send messages, memorandums, and design files to the different team members. However, this was found to be inefficient when attaching large design files. The E-mail system used by the Corps of Engineers transmits large amounts of information daily. The system, therefore, has a low priority on messages sent with large design and other files attached. Large design files were taking several days to get from one district to the other. In addition, files sent between the districts, the A/E contractors, and the customer frequently did not transmit correctly and became corrupt. E-mail, however, turned out to be a very effective way to send and document routine messages between all team members, especially since it was very seldom that all members were in their offices at any given time.

A shared drive was established to transfer files between the two districts. The drive was physically located in the Mobile District; however, both Nashville and Mobile could access it at any time. The disadvantage to using a shared drive is the potential for copying over the “latest” information with “old” information. A website (ftp) was used to share files and data, including design drawings, between the Corps and the A/E’s.

Although the shared drive, website (ftp), and E-mail were used very extensively, a need still existed for face-to-face meetings. The purpose of the meetings was to discuss the project, make decisions,

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exchange and discuss information, and assign tasks. The face-to-face meetings were also used to generate “team spirit” and mutual respect by providing opportunities for the team members to meet and get to know each other.

The telephone was used almost daily to communicate with the various points of contact within the two districts, the two A/E offices, and the customer. Major problems and questions were effectively addressed via telephone conferences. However, occasions frequently arose when design team members from the two districts needed to discuss specific details on various design drawings. A software program called Net Meeting was used to accomplish this. Net Meeting enables a CADD drawing to be simultaneously pulled up on screens at the different sites, e.g. Nashville and Mobile. The drawing can be modified with the changes shown on the screen at the individual remote sites. This allowed the designers at the different sites to discuss details on a particular drawing and make mutually agreed to changes to the drawing. The respective designers visually observed the changes as they were being made. This capability and procedure reduces the possibility of errors resulting from miscommunication. The use of Net Meeting or similar type software enhances the probability of success for the “virtual team” concept, which is an essential component of the Regional Business Centers.

Major design related decisions were generally accomplished using the synergistic affects of involving all of the team members associated with the problem at hand. An example of this was the decision to use a tunnel for river diversion instead of a concrete culvert. E-mail and telephone conferences were used to exchange information and to discuss individual recommendations prior to the final decision being made. The final decision was endorsed by all of the involved team members.

The shared drive and website were used exclusively for compiling and coordinating all of the final design documents. Written documents were posted, read immediately, and updated as appropriate. This helped to coordinate and insure that any discrepancies between the various documents were eliminated. This included between drawings from the different technical disciplines, as well as between drawings and specifications and between the different technical specifications sections. Also, the process helped insure consistency in format and content throughout the various design documents. Use of the Internet greatly reduced the design review and review comment compilation time between the two districts and the two A/E’s.

An Independent Technical Review (ITR) Board was established to review the project technical documents, i.e. plans, specifications, and design analysis. The ITR Board consisted of personnel from the Nashville and Mobile Districts and the two A/E offices, all of who were not involved in the actual design process. The ITR Board also consisted of retirees from the Corps who are considered to be unique technical experts in their respective fields. The retirees were contracted by the Corps to provide their ITR services. The customer/sponsor was also on the team and attended all the design meetings, as well as all of the design review meetings. The ITR Board members attended all of the scheduled design review conferences along with the design team members. Design documents to be reviewed were provided to the ITR Board members by E-mail and regular mail several weeks prior to the review conferences. Review comments and subsequent responses to the comments were submitted to the lead district for compilation and distribution. The compiled review comments and responses were distributed to the ITR Board members prior to the next design review meeting.

In conclusion, it is important to point out that when using the “virtual team “ process for the first time you can expect to experience a lot of lessons learned and may encounter a few bumps in the road. The

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main lesson learned, however, is don't get discouraged. Employing the virtual team design process for the first time highlights the importance of maintaining good communication at all levels and between all team members. Working with team members from various remote locations accentuates the value of communication in the design process. Another lessons learned was that the establishment of a shared drive is a must for the timely exchange of large data files and to provide a common repository for all project files. The shared drive becomes the backbone for project documentation. Net Meeting is also a must for reviewing, discussing, and revising drawings by team members while remaining at their remote sites. Net Meeting allows for live, real time communication regarding a drawing, specification item, and other design documents between a number of team members while working at their home workstation. This software has great potential especially as computers and Internet data exchange becomes faster. E-mail is an essential tool to notify team members of upcoming meetings and current issues. It is also a beneficial documentation tool. The face-to-face meetings are still one of the most effective tools in team building, even in the virtual environment. The individuals brought together from the various sources to work on this project not only became an efficient and effective study and design team, but also built some very strong and lasting friendships. The successful outcome of this virtual project delivery team is convincing evidence that the Corps can go beyond district and even MSC boundaries to pull together the appropriate expertise to successfully complete a project.

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## **CREATING THE RIGHT TEAMS NEW ORLEANS DISTRICT EMPOWERS PROJECT DELIVERY TEAMS**

New Orleans District is continuing to work on a new way to do business, and improving district effectiveness is the primary goal. It's called the Project Management Business Process, and empowered project delivery teams (PDT) are the chosen tools. These teams consist of project managers and members of any other division or office that's needed to execute a project.

In the past, separate divisions worked together but somewhat independently to produce a product. Most of the major decision-making rested with upper management. Over the last few years the idea has been to promote more teamwork among the divisions and empower project delivery teams for project implementation.

The district's Engineering Division is a founding member of the project delivery team concept, which features engineering functional team leaders (FTL) who coordinate the engineering resources for the job. They are empowered to accomplish the team's performance objectives and commitments, and serve as Engineering's lead point of contact with the project manager and others.

The FTL's are responsible for maintaining the schedule and budget, facilitating independent technical reviews, communicating technical viewpoints, and making decisions through meetings and correspondence. They also work with management to obtain the resources needed to meet the team's objectives, and provide input to each team member's performance appraisal.

The Engineering Division has also been highly supportive of the empowered PDT process by making organizational changes both to support the teams and manage an ever- increasing workload. This included flattening the Design Branch by reducing sections and creating areas of expertise. It turned some sections chiefs and supervisory positions into functional team leaders, created deputy branch

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chiefs and consolidated supervisory duties. In the process, it established three new GS-13, FTL positions.

Finally, Engineering also re-instituted a holdover from pre-project management days, a monthly project schedule review meeting conducted by a project steering committee.

**Pushing the Power Down --** The district implemented the empowered team concept about two years ago when Planning and Project Management divisions were combined. Falcolm Hull, chief of Project Management-West, refers to the concept as “pushing the power down to the people doing the work.” These teams have the authority to make decisions, thereby executing a project faster and more effectively.

“Jobs as supervisors have changed,” explained Keven Lovetro, chief of General Water Resources Section, Economics Branch. “We don’t have to look over our employees’ shoulder anymore.”



But the actual definition of empowered teams is still under construction. “There are several definitions of an empowered team,” Hull said. “In order for us to operate effectively and efficiently in the New Orleans District, we need a common definition.”

Hull organized a process action team (PAT) of employees from each division to research and define empowered teams. They’re responsible for recommending how an empowered project delivery team will operate.

**Fine Tuning the Team --** The PAT was charged to accomplish the following to further refine the project delivery team concept:

- Define in detail team empowerment as it relates to the team structure and the decision-making process.
- Define the team configuration and process of project management for small, medium, and large projects. This would include the use of (EXPLAIN) FTL’s and the direct relationship of the project manger to individual team members.
- Define who should be on the core team and primarily responsible for project execution.
- Determine what processes within functional areas need to be changed or eliminated to better support the PDT.
- Identify business practices within New Orleans District that inhibit team empowerment.

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- Clarify roles and responsibilities or ground rules that identify appropriate behavior of team members.

The PAT also reviewed the district's general teamwork strategy and will address these areas:

1. Team Communication Strategies:

- Ensure timely sharing of information among team members, stakeholders, and management.
- Address conflict intervention
- Establish systematic problem solving

2. Decision making process:

- Charter an agreement that clearly states what the team wants to accomplish, why it is important, and how the team will work together to achieve results

3. Award Strategies:

- Team awards (monetary/non-monetary)
- Individual recognition
- Evaluations

4. Accountability strategies

- Establish strategies to ensure that commitments are kept.

In March the district executive team will meet twice to address the PAT's recommendations on the empowered PDT's roles and responsibilities, procedures, and their interaction within the district. District leaders will, in turn, set policy.

The branch chiefs will continue to use their professional expertise to train the project delivery teams. "Everyone will know how we operate from top to bottom," Hull said.

"We all work as a team to get the job done," said John Saia, deputy district engineer for project management and chief of Planning, Programs & Project Management.

"Our intent is to ensure that our team members have the tools necessary to do their jobs, the support of management to accomplish their jobs, and a consistent understanding across the district of what teamwork is," Saia said.

Even though the new Project Management Business Process has only been implemented for two years, the outlook is positive. When asked if the process is working to the level it needs to be, Saia responded, "We're getting there."

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## *District of the Month*

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## PITTSBURGH DISTRICT

Pittsburgh District, part of the Great Lakes and Ohio River Division, includes portions of five states, Pennsylvania, Ohio, New York, Maryland, and West Virginia in its civil works area of responsibility. The District operates and maintains 23 navigation locks and dams, 16 reservoirs, and 3 Federally maintained local flood protection projects. Known as the Headwaters District, our four main mission areas are Navigation, Flood Damage Reduction, Infrastructure Rehabilitation, and Ecosystem Restoration.

Our largest current projects in the navigation area are our \$705 million Lower Monongahela River project and the upper river portions of the \$3 billion (construction cost) Ohio River Main Stem Study.

The Lower Mon project consists of construction of a new dam at Braddock, PA, new twin 84' x 720' lock chambers at Charleroi, PA, removal of existing locks and dam at Elizabeth, PA and major associated relocations and dredging. The new dam at Braddock is currently under construction and is being built using in-the-wet technology (see later articles). Another portion of the project currently under design is the raising of a main line Norfolk and Southern Railroad Bridge to assure mandatory vertical clearance for inland navigation when the new navigation pool is completed.

The District's 16 operating reservoirs and 39 Local Flood Protection Projects prevented an estimated \$120,000,000 of damage during FY00. We are currently modifying Tygart Dam, which was constructed in 1938, under the Dam Safety Program in order to address spillway capacity and structural stability concerns relative to current criteria concerning the probable maximum flood event. Using Value Engineering and with the assistance of model studies done at USACE Engineering Research and Development Center, the project was able to be rescoped at a cost savings of \$25,000,000.

We are partnering with some local communities to share our technical expertise in a regional initiative to upgrade water and sanitary sewer systems throughout Western Pennsylvania. Authorized under Section 313 of the Water Resource Development Act of 1992, this program is significantly improving the quality of life and economic viability of the region.

Another area of focus is the development of projects that restore environmentally damaged areas for a cleaner, healthier region in the 21st century. These ecosystem restoration projects, partnered with other Federal, state, and local agencies, have resulted in cleaning up "Brownfields" sites and Acid Mine Drainage (AMD) areas, using innovative design and construction techniques, both as primary and secondary project purposes.

We also have ongoing Support for Others (SFO) work with a variety of clients such as the Office of Surface Mining, the 99<sup>th</sup> Regional Support Command, and the Panama Canal Authority.

Following are some brief articles about some of our existing work.

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**Anticipation Escalates At Braddock Dam --** The level of excitement is increasing daily as construction of the Braddock Dam at the Leetsdale Casting Facility continues at an aggressive pace. Launch and towing of Float-In Dam Segment 1 is scheduled for early spring. Over two hundred precast concrete panels have been erected, forming the exterior and internal diaphragm walls of the dam segment. The cast in place concrete bottom slab has been placed and post tensioned and approximately one quarter of the vertical closure placements between the precast panels are finished. Construction of the top slab of dam segment one, which will effectively complete the assembly of the mammoth concrete shell structure, has begun and will take approximately two months to finish. When completed, the dam segment will measure 333 feet by 104, and rise over 40 feet tall. Prior to launch, the dam segment will receive final commissioning inspections by the contractor's marine specialist and Corps experts.



The second and smaller of the two dam segments, measuring 265 feet by 104 feet, is being assembled next to its larger mate. Nearly two hundred panels are being used in the assembly of this segment. Completion of this segment is slated for early summer.

When Float-In Dam Segment 1 is approved for launch, water will be pumped into the casting basin until a sufficient amount has been added to displace the nearly 11,000-ton reinforced concrete shell. After the segments' balance has been adjusted and the floating structure is once again inspected by marine experts, it will be towed to the outfitting facility located about two miles upstream of the Braddock Dam site where it will receive the necessary equipment and work platforms for set-down.

Workers at the Braddock Dam site continue to install the foundation-drilled shafts onto which the dam segments will be founded. Eighty-nine reinforced concrete drilled shafts, measuring 78-inches in diameter are being drilled into the rock that underlies the riverbed material. Other foundation preparation work such as pre-dredging, cut-off wall installation and gravel bed placement has been completed.

Anticipated set-down for the first dam segment is mid-summer 2001.

**Braddock Dam Foundation Tests --** Drilled shafts are to be used for the foundation of the new dam. The upper alluvial soils at the site will be dredged down to the base elevation of the new dam and then drilled shafts will be installed vertically through the remaining soil and a clay shale layer underlain by siltstone. Each drilled shaft will sustain an axial load of several hundred kips and a commensurate magnitude of lateral load. It was decided that comprehensive loading tests would be of great benefit in the sizing of the production shafts. Thus, a load-testing program was undertaken on two five-foot diameter shafts.



The test shafts were loaded both axially and laterally. For axial load testing, the

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Osterberg-cell method was used. For lateral load testing, the two shafts were pulled together using a tension bar and hydraulic jack. Both load test methods avoided the need for costly reaction frames to be used.

The two shafts were of different lengths. Test shaft A extended 15 feet into rock where as test shaft B extended 25 feet into rock. ASTM standard test methods for piles under static axial compressive loads and lateral loads were followed. In addition, cyclic lateral load testing was performed using a procedure proposed by the sub-consultant. The test results demonstrated that test shaft A, the shorter shaft, was sufficient to support both the applied lateral and axial loads.

**Locating Submerged Structures within Pool 3 --** The Lower Mon Project will raise existing Pool 2 by 5 feet and lower existing Pool 3 by 3.2 feet. The Monongahela River Navigation System has a history of development that dates back to over 150 years. Abandoned structures, sunken features, and other objects buried under the river bottom present a unique challenge when undertaking these improvements as dredging is necessary to maintain authorized navigation channel depths. Municipal and privately owned submerged pipeline utilities crossing the river channel to supply local communities with natural gas, drinking water, and sewer facilities in Pool 3 are of particular concern since costs in relocating those utilities adversely affected by the pool changes can be considerable. Cover computed from hydrographic surveys determines whether or not these pipelines will be protected during dredging operations. Accurate surveys are required to determine if the object meets minimum cover requirements. Recent advances in underwater sensors provide the hydrographic surveyor with new capabilities to increase coverage, accuracy and imaging in hydrographic and sub-bottom investigations.

The District along with the Topographic Engineering Center (ERDC-TEC) are investigating capabilities of geophysical, electromagnetic, and acoustic sensors to detect and locate water, natural gas, and sewer pipelines on the Lower Monongahela River between the communities of Donora and Charleroi. In May 2001, Marine Search and Survey, and Environscan conducted pipeline surveys using radio detection equipment and low noise magnetometers. Small survey vessels equipped with GPS positioning and on-board data processing are used to run cross-sections over the areas of interest. Radio detection energizes the pipeline with an electromagnetic signal, which is then received by a directionally sensitive antenna. The response between two antennas is used to compute a distance within a range of up to 30 feet. A low noise marine magnetometer is used to identify variations in the earth's magnetic field produced by ferrous objects. Pipeline location and depth are processed from magnetic anomaly signatures at girded stations or along profiles mapped with GPS. Combinations of sensors are employed to ensure consistent results in horizontal and vertical positioning.

Sometime in FY 01, evaluations of acoustic sensors will be made on the Lower Mon Project using a parametric echosounder, a sub-bottom sonar design that synthesizes a low frequency acoustic signal having the ability to penetrate through the top layers of sediment below the river bottom. Profiles of the sub-bottom sediment layers and buried objects are produced from these types of sensors. Marine geophysical surveys are continually refining technology and methods to improve accuracy in depth estimation.

**Quality Management --** Engineering Division continues to develop its Quality Management System. To lead this development effort, the Division recently established a new full-time position for a Quality Management Officer. Reporting directly to the Assistant Chief, Engineering Division, the QM Officer will be responsible for administering a quality program for all areas of engineering work within

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Engineering Division. The goal of the program is to consistently produce quality products that meet customer needs on time and on budget.

In addition, the District's senior leaders recently approved a recommendation to pursue ISO 9000 certification. The plan is to certify the Pittsburgh District Project Management Business Process (PMBP) to the internationally recognized quality standards of ISO 9001:2000. This cross-functional effort will include all PMBP elements – Engineering, Construction, Real Estate, Planning, Project Management, Operations and Readiness, and Contracting. Through development of the quality system manual and processes, the ISO 9000 initiative will assist the District in embracing the PMBP for all projects with the goal to be certified by the end of FY 2002.

**Berlin Dam --** In 2001, Berlin Dam will be the oldest, totally rehabilitated dam within the Pittsburgh District. After 60 years of service, the dam will have a new concrete service bridge, a new electrical system, a new sluice, and low flow valves, refurbished tainter gates and a new maintenance bulkhead crane.

In 1997, a \$3 million contract was awarded to construct a new service bridge, rehabilitate the electrical system and refurbish the tainter gates and drives. Currently, a contractor is replacing the three existing 36" diameter gate valves with three service and three emergency ball valves. Also, concise, low flow control will be attained after the installation of two new 36" diameter ring jet valves, 36" diameter emergency ball valves, new ductile iron pipe and new intake bells. Similar ring jet valves have been successfully installed at other facilities within the Pittsburgh District for low flow augmentation. The design and installation of the new ring jet valves utilizes two existing 5' x 7' sluices and slide gate intake/control sub-structures that were constructed in 1936 for future development. Two new concrete pylon extensions will house the ring jet valves with access provided by two new galleries cut into the existing dam.

These two new galleries are constructed by first cutting the perimeter of the each gallery using a diamond wire saw. The concrete is then removed by a remote controlled robotic jackhammer. The overall installation of the 3 service and 3 emergency ball valves requires 120 cubic yards of concrete removal. Approximately 500 cubic yards of new concrete will be placed to construct the two new concrete operation pylon extensions.



Concrete removal and new reinforcement for installation of new service and emergency ball valves.



Robotic jackhammer removing concrete from downstream end of new access gallery.

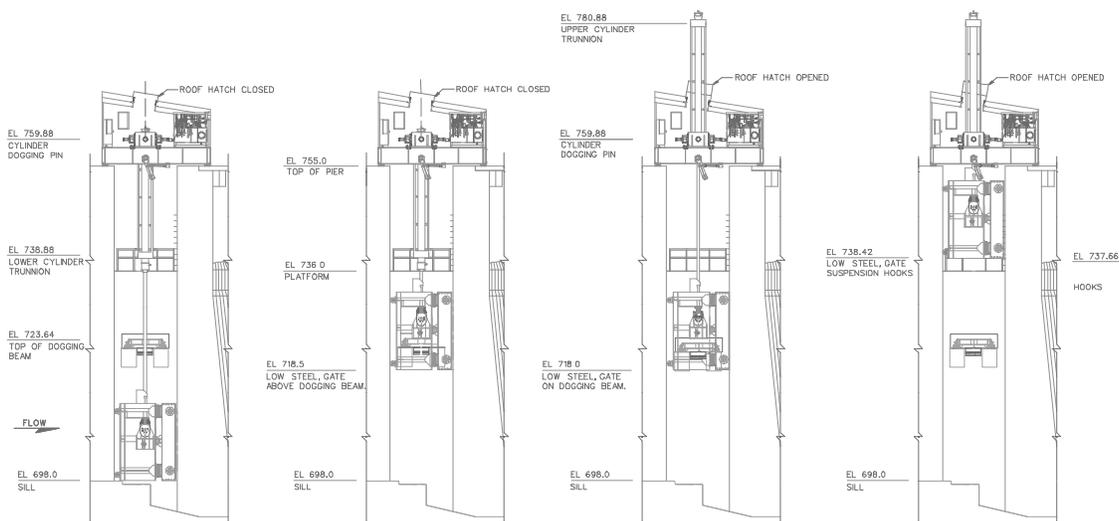
The current contract was also modified to supply a new rail mounted-maintenance bulkhead crane which is more manageable, less labor intensive to operate, safer, and more reliable.

At the completion of this contract, Berlin Dam's overall rehabilitation effort will end, technically, resulting in a 50% increase of flow passage, better low flow and water quality control, more reliable and maintainable operating machinery, and decreased operational expenses. Ultimately, these combined efforts will provide better flood control, assist in preserving the natural resources of the area and assist in maintaining and improving public recreation at the project.

**Emsworth Dam Vertical Lift Gate and Hoist Replacement** -- Emsworth Locks and Dams are located at Neville Island on the Ohio River and creates the pool at Pittsburgh. The facility consists of dual lock chambers, a main-channel dam with 8 vertical lift gates and a back-channel dam with 5 vertical lift gates and 1 Sidney gate. Each dam gate is 110' long with a damming height of 12' above the sill. The existing gated dams have been operated since 1938, when the original fixed-crest dams were modified by removing the crest and leaving the lower portion to serve as an apron and stilling basin for the gated dams.

A moderate rehabilitation was conducted on the gates from 1983 to 1987 in an effort to extend their useful life until replacement could be accomplished, with the expectation that this would occur by the year 2010. Unfortunately, the minimal retrofitting has fallen short of that goal since 6 of the gates have experienced recent failures of the lower wheel assemblies. The lower portions of the gates are deteriorated, with significant loss of metal from the structural members and fasteners due to corrosion. The lift gate machinery is original, consisting of a large roller chain type hoist attached to each end of a gate. The large chains are difficult to maintain because there is no means of greasing the inner bearing surfaces, resulting in frozen links. Reliable gate leveling and positioning is also difficult to achieve with this type of machinery.

The Pittsburgh District is currently planning the complete rehabilitation of both Emsworth Dams. A new lift gate and new hydraulic cylinder type gate hoists have been designed. A contract is now underway to replace the gate and hoist machinery in one of the fourteen gate bays. The new vertical lift gate, hoist and control system will be installed in gate bay 7 on the main-channel. The new gate is a modern welded design (instead of riveted) making it both stronger and lighter than the existing gates. The wheel assemblies were also redesigned, utilizing two wheels per side instead of four.



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Using normal single stage or multiple stage hydraulic cylinders was impractical and cost prohibitive due to the 40' stroke required to fully raise Emsworth's large vertical lift gates. Therefore, an innovative cylinder was designed that raises itself in two stages, cutting the required stroke in half (20'). The cylinder body has two trunnions, one at each end of the body, connected together by guide rails. Hydraulically operated trunnion pins are retracted to disengage one trunnion, allowing the cylinder body to travel on the guide rails to the other trunnion. The pins are then extended to engage that trunnion. Hydraulically operated dogging beams will be installed at the mid point of gate travel (20'). For daily operations the cylinder normally hangs from the upper (rear) trunnion, allowing gate operations from 0' to 20' open. During a major flood event the gates are fully raised to 40' where they are hung from dogging hooks. To do this, the gate is first raised 20' and supported by the new dogging beams. The trunnion pins are then disengaged from the upper trunnion and the cylinder is extended to raise the cylinder body and engage the trunnion pins in the lower trunnion. After the lower trunnion is engaged, the gate is fully raised to the dogging hooks. The complete operation is programmed to raise the gate automatically from 0' to 40' as if it were a single stage lift. The two hoist cylinders are synchronized electronically by sensing rod position to insure reliable operation of the new gates, with precise leveling and positioning, and low maintenance.

**Replacement of Port Perry Railroad Bridge Near New Braddock Dam** -- Braddock Dam is being constructed on the Monongahela River to replace the existing fixed crest dam. When completed, the new dam will cause a 5-foot rise in the pool elevation where Norfolk Southern's Port Perry Bridge crosses the river. This rise will reduce the existing bridge clearance under the navigation channel's 407-foot through-truss open-deck span, such that overhead clearance will be 2.6 feet less than the U. S. Coast Guard's minimum. A design study was launched by Pittsburgh District to find a cost effective solution to this problem.

Three alternatives were considered during the study, to include: replacing the navigation channel's through-truss span, constructing a new river crossing, or diverting traffic over an adjacent bridge on a permanent basis. A preliminary cost analysis of the alternatives was performed, which resulted in the selection of the through-truss replacement for conceptual design.

Preliminary structural design indicated that a new truss could be designed with a shallower floor system, incorporating two additional floor beams between panel points. This new design would incorporate Grade 50 structural steel, with box section chord members and floor beams designed as simple spans. The overall geometry of the new truss would be similar to that of the existing truss. The existing truss would be jacked up and removed using a dual barge system, and the new truss would be placed in a similar manner. An alternate design calls for extending this span to 457 feet by demolishing the existing landside pier, and constructing a new landside pier farther inland.



The navigation span foundation piers were constructed in 1873 using stone masonry. The channel pier is supported on timber piles, while the landside pier is supported on a timber crib. Both piers would be reinforced by concrete encasement, with structural concrete tied through the existing masonry, and supported by steel piling. New pier caps would be constructed using steel grillages.

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Cofferdams would be required to construct the new pile caps in the river. Reinforcement of the landside pier would require about 1000 feet of adjacent track to be realigned. The alternate design and new landside pier construction would eliminate this realignment.

Discussions are presently underway between Pittsburgh District and Norfolk Southern regarding final design and construction of the replacement span.

Our 150-person Engineering Division mission is to “provide world class engineering products and services to support the water resources needs of the region and the nation;” “We deliver what we promise.”

For additional information on any of the projects found in the articles, please contact the POC directly. For more information concerning other innovative work we are engaged in, contact our website at <http://www.lrp.usace.army.mil/>.

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AND DANIEL H. HITCHINGS, P.E., CELRP-ED, (412) 395-7250*

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## Update

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### MILITARY CONSTRUCTION COST MANAGEMENT USING ACTIVITY BASED COSTING

The Louisville District volunteered to be a test district to employ Activity Based Costing (ABC) on selected projects in the military construction management business area. On 1 December 2000, the Director of Military Programs selected Louisville as part of a pilot study to determine actual costs of S&A. Five other districts -- Kansas City, Omaha, Seattle, Norfolk and Honolulu, are involved in the broader pilot study and are tracking actual S&A costs at the project level.

The purpose of the ABC study is to determine actual costs by management activity and to help determine the feasibility of implementing ABC for other Corps operations. This initiative is part of a Defense-wide cost management strategy, using ABC where appropriate, to deliver better quality products and services to customers while continually improving cost.

The purpose of the broader S&A pilot study is to establish a basis for future decisions that would enhance efficiency, effectiveness and customer satisfaction of the construction management phases. The study will also include a comparison and evaluation of budgeted and actual direct charge costs on a project-by-project basis against current flat rate procedures.

The project delivery team is comprised of:

|   |  |
|---|--|
| Project Manager – Bill Zaner, Kansas City | District RM – Marv Omerod, Louisville    |
| HQ PM – Phil Pinol                        | Construction – Terry Gosmire, Omaha      |
| HQ E&C – Terry Wilford                    | Construction – Louis Muzzarini, Honolulu |

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HQ RM - Phil Blount  
District PM – Olton Swanson, Seattle

Area Office – Bill Robson, Norfolk  
ABC Advisor – Ed Vogel, HQ

In the Louisville District, costs will be tracked in CEFMS within the MILCON, O&M and HTRW S&A flat rate accounts for the following nine-construction business:

|                                  |                                   |
|----------------------------------|-----------------------------------|
| S&A Fiscal Management            | Completion, Transfer and Closeout |
| Submittal Management             | Field Engineering Management      |
| Quality Management               | Project Funds Management          |
| Contract Modification Management | Contract Claims Management        |
| Progress Payment Management      |                                   |

The cost data collected will be used to verify and/or adjust the initial ABC estimates developed in the Corps' January 2000 Logistics Management Institute (LMI) study entitled "Improving U.S. Army Corps of Engineers Construction Business Practices". Detailed flow charts for each of the nine S&A business process can be found in Appendix A of the LMI study, located at <http://globe.lmi.org/usace/>.

POC: EDWARD B. VOGEL, CERM-P, 202-761-1959

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## *Dam Safety*

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### **DAM SAFETY IN THE PALM OF YOUR HAND**

A handheld computer, like the Palm Pilot, can be a convenient tool to make dam safety more cost effective and efficient. As part of the development efforts for the National Inventory of Dams (<http://www.tec.army.mil/nid/>), USACE contractor Mike Grounds of Beacon Resources has developed a Palm Operating System prototype application for data collection during a dam safety inspection. An application of this type can be used to gather critical dam safety data - inspection data, NID data, or other data for the Dam Safety Program Management Tools (DSPMT). This prototype application was downloaded by a number of people at the October 2000 ASDSO Conference, and was universally praised.

While laptop or notebook Personal Computers have traditionally been used for data collection due to their processing and data storage capability, advances in handheld devices have made them an excellent choice for the field. Portable PCs are relatively bulky, heavy, expensive, and have limited battery capacity. Handheld computers can be easily stowed in a pocket, are inexpensive, have a variety of peripherals available, can turn on and off instantly, and can operate for weeks between charging or battery replacement.

A basic data collection suite can be completed with a handheld computer, a camera attachment, and a GPS attachment. For example, the author has demonstrated this application with a Palm IIIc (8 MB memory, color screen – around \$329), a Kodak Palm Pix camera attachment (24 bit VGA, 640 x 480 maximum resolution, 2X zoom – around \$125), and a DeLorme Earthmate GPS attachment (around \$150). A folding full-sized keyboard (around \$99) can be added to make text entry easier if a working surface is available. A variety of modems (landline or wireless) are also available, or other handheld models (e.g. Palm VII series) have fully integrated wireless Internet capability.

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The handheld computer would run a customized inventory or inspection checklist, similar to the prototype application. The data collected in the field would be entered on the fly onto the unit's screen using the included stylus, or by attaching the external keyboard. Exact locations of project features or defects would be determined with the GPS unit, and then images captured using the camera. To complete reports, the collected data would be transferred to a PC via modem, or by a plug-in connection.

The Federal Energy Regulatory Commission has taken steps to demonstrate this concept, based on the prototype application. This spring, FERC plans to use Palm handheld computers for performing inspections and preparing reports for low-hazard potential dams on a trial basis.

If you are interested in downloading the USACE prototype application for the Palm Operating System, visit the Beacon Resources website (<http://www.riversrus.com/>), and click on "free palm based application for dam safety inspections", or e-mail Mike Grounds at [Mike@riversrus.com](mailto:Mike@riversrus.com).

*POC: BOB BANK, CECW-EWS, 202-761-4243*

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### NATIONAL DAM SAFETY DAY

The support of the public awareness portions of the National Dam Safety Program, FEMA will sponsor a National Dam Safety Day program on Thursday, 14 June 2001, at the National Press Club in Washington, DC. District Dam Safety Program Managers are encouraged to work with their Public Affairs Office to public Dam Safety publicity and public events during the week of 10 June 2001. Additional information on the planned events in Washington will be in future issues of this newsletter.

*POC: CHARLES PEARRE, CECW-EIS, 703-428-7343*

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## Information

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### SUSTAINABLE DESIGN AND DEVELOPMENT RESOURCE WEBSITE

A new website entitled "Sustainable Design and Development Resource", and is located at <http://www.cecer.army.mil/SustDesign>. The site was built to help planners, designers, engineers, and builders create "sustainable" facilities. Take a few minutes to review the site and learn about sustainable design.

*POC'S: HARRY GORDIA, CECW-ETE, 703-428-6460,  
AND ANNETTE STUMPF, CEERD-CF-N, 217-352-6411 EXT 7542*

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### JOB VACANCIES

One temporary duty position and one position in CECW-E are highlighted here for the information of our readers.

**Tulsa District TDY Vacancy** -- Tulsa District has experienced an increased workload at our Tinker AFB office. We are in immediate need of electrical engineers to help oversee the construction efforts. If you have anyone who would be interested in supporting our needs on a 60 or 90 day assignment, please contact the Tulsa District Engineering and Construction office at 918-669-7008.

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**CECW-E Vacancy** -- Recruitment for a GS-15 Cost Engineer position (Cost and Economic Team Leader) at HQUSACE, Engineering and Construction Division is under way. The announcement Number is NCR1378-01-CH. Position details and the application procedure is listed at the following web address: <http://www.cpol.army.mil>. Please insure that any eligible cost engineers within your Divisions, Districts or Offices are aware of this recruitment action and have the opportunity to apply.

*POC's: RUSSELL HOLEMAN, CESWT-EC-C, 918-669-7302,  
AND ROY BRADEN, CECW-EI, 703-428-6933*

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# Training

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## **INTERN LEADERSHIP DEVELOPMENT COURSE (ILDC) OPPORTUNITY**

Buffalo District has again decided to sponsor a session of the ILDC, which is a mandatory course for all Army interns. This includes both DA interns and local interns (defined as any employee at the GS-5, 7, or 9 level with a non-competitive "target" grade of GS-11 or 12). The course will be held in the Buffalo area from 12-16 March 2001

In addition to our own folks, we already have some attendees scheduled from Omaha District and Ft Drum. There are still about a half dozen spaces still available. This would be a good opportunity for intern level employees to take this training with other Corps folks. That way the classroom discussions can focus on topics of common interest. It is also an opportunity for these newer employees to start "networking" with other new Corps employees. Last year's students also enjoyed the social opportunities during their off-duty hours (after they did their homework!).

*POC: JOHN L. LANDAHL, CELRB-PE, 716-879-4217*

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## **DIVERSITY SEMINAR**

OPM is offering a Diversity Seminar at their Western Management Development Center and Eastern Management Development Center. The seminar will address diversity under the new administration; including work force diversity has evolved from sound public policy to a strategic business imperative- and our leadership curriculum is keeping pace. In this essential seminar, managers and executives learn how to make diversity an organizational advantage.

The dates for the seminar are March 19-23, 2001, Shepherdstown, WV, and June 18-22, and September 24-28, 2001, in Denver, Colorado.

A Sampling of Key Results from this Seminar:

- ~ Understand the basics of national diversity policy
- ~ Identify strategies for developing an open organizational culture
- ~ Learn cross-cultural communication skills
- ~ Identify strategies for effectively building diversity, including techniques for effective recruitment, career development, and retention
- ~ For more key results, go to <http://www.leadership.opm.gov/fs38.html#key>

Who Should Attend:

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~ Individuals at GS-13 through GS-15 or equivalent who have responsibility for supervising or managing a work force and who want a better understanding of how to build and manage a diverse work force.

Contact OPM for space availability at 304-870-8008 or learn more about the seminar at <http://www.leadership.opm.gov/fs38.html>

POC: CHARLES PEARRE, CECW-EIS, 202-761-7343

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### EXECUTIVE LEADERSHIP DEVELOPMENT PROGRAM (DELDP)

ASA(MRA) has extended the suspense date of 26 Jan 01 for the DOD Executive leadership Development Program (DELDP) due to the low number of applications received. The new suspense date to CEHR-D is 16 Mar 01 in order to meet ASA(MRA) suspense of 2 Apr 01. Detailed information on the program and application can be found at <http://cpol.army.mil/train/catalog/ch04deldp.html>.

POC: MARILYN S. JERRELL, CEHR-D, 202-761-5004

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## Open Discussion and Comments

No Items Submitted for this Issue.

(Editors' note: If you want to share your thoughts with our readers regarding a subject of general interest, send an email to the E&C News editor at [charles.pearre@usace.army.mil](mailto:charles.pearre@usace.army.mil). A synopsis of your comments will be published next time).

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## Editors' Notes

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### SUBSCRIBE TO ECNEWS

Engineering and Construction News uses a subscription list on the Corps List Server. The name of the list is LS-ECNEWS. The purpose of the list is to distribute the Engineering and Construction community newsletter, *Engineering and Construction News*.

You can subscribe or unsubscribe to LS-ECNEWS by sending an e-mail message to [majordomo@ls.usace.army.mil](mailto:majordomo@ls.usace.army.mil) with no subject line and only a single line of text in the message body. That single line of text should have the following format: **subscribe ls-ecnews** or **unsubscribe ls-ecnews**. The List Server system will automatically pick up your originating e-mail address from the message and add it to or delete it from the distribution list.

If you have any questions about the list server, see the List Server E-Mail Delivery System web page at <http://eml01.usace.army.mil/other/listserv.html>. Or you may contact Charles Pearre if you have additional questions on the subscription list.

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