

*Site of the Three Gorges Dam.  
Photographs taken during General Morris' trip to China in February 1980.*

very primitive, no heat at night and little heat in the daytime but occasional hot water this time; however, you didn't dare get up in the middle of the night because it was bitter cold. Seems like everyone except me became ill.

The next day we boarded a riverboat and went up river to the Three Gorges Dam site. We passed beautiful scenery into the high gorges and debarked to visit dam site borings. After a brief visit we had lunch on the boat on the return to Yichang. Then back to Beijing. In those days, the best hotel was the Beijing Hotel. The present new hotels were not yet built. Cars were rare; everybody walked or rode a bicycle.

Contrary to Russia, the Chinese were very friendly to the military. I wore my uniform to the first briefing and I realized right away I was getting too much attention. Our chairman, Dave Freeman, was being ignored to some extent so I wore civilian clothes thereafter.

Our headquarters in Beijing were in the American Embassy where our whole group met to prepare our final report. En route to Beijing from Three Gorges, we traveled by train for part of the trip during which Lloyd Duscha, Bill Murden, and I discussed the Three Gorges Dam. Having seen other dams, I felt I should raise some questions about Three Gorges when we met with the Chinese officials. The Corps team seemed to support my views. As a result, I told Mr. Freeman, as we were preparing for our final briefing, of my reservations and questions about the Three Gorges Dam.

As an example, the Chinese talked about comprehensive base planning, project planning. They had all the right words but I had the feeling that they maximized the power productivity and then they stuffed flood control, transportation, et cetera, into the project. That bothered

me. I gave Dave Freeman a preview of my briefing. He indicated I should make my points. I then asked if I could go last because my presentation was going to be controversial.

As the final meeting with the Chinese proceeded, everyone's presentation was smooth and pleasantly received until I came along. I began by mentioning we hadn't been there long enough to get answers to many questions, however, our visit had generated some questions that needed to be answered. Perhaps they had the answers to them and if so-fine. If they didn't, they shouldn't build the project until they got the answers. That was the thrust of it.

The guests were all on one side of this long table and the Chinese on the other. I was sitting next to Mr. Freeman, who was straight across from Mr. Li Rei. The Minister of Commerce was there with the Minister of Communications, a woman. They did not seem to support the project. Also present was Mr. Wei, the chairman and president of the Yangtze River Development Authority. Of course, he was very much in favor of it.

Anyhow, I indicated there were five questions.

1. Would the Yangtze River be more important over the next century for transportation or for hydropower?
2. Would it be more productive to build a number of smaller, yet large projects on the excellent tributary dam sites, which would get their industrialization program moving forward more rapidly? Even the smaller ones would be as big or bigger than anything in the U.S.
3. If you're going to have flood control, and you're going to build levees below the dam, why not raise the levees higher and strengthen them and lower the Three Gorges Dam?
4. What problems were they going to have with environmental effects upstream in the reservoir and dislocation of hundreds of thousands of people?
5. Were they prepared to put all their eggs in one basket in case they had a disaster, a military operation, or some other event that put the project out of order?

So those were the five questions. The implication was that the project should be held off until they were answered. In the course of doing this, Mr. Wei from this Yangtze River Development Authority made an outburst but Li Rei kept order.

After the meeting ended the Chinese group came over saying things to me that I didn't understand. Turned out, though, many were favorable. I was surprised that there was so much support for not proceeding with that project at that time. I don't suggest there was support for abandoning it, but over a decade later they still haven't built it. They're going to build it, but they have changed their configuration. It's lower. The navigation situation is much better than it was in the older project. It's a tough job but they can do it; it can be done. They've found a way to relocate their people, apparently. I'm satisfied the questions were valid and worth answering. I expressed to Mr. Li Rei before I left my hope that I hadn't done anything to cause a big problem but I felt that we were asked to come over to give our opinions.

There were several articles written against the project and I was interested, and disappointed to a degree, to see that there was only one article that intimated that the Corps of Engineers might have had an influence on the project's description and configuration.

I went back to China in 1985. I taught a summer course in management as part of the University of Maryland's exchange with East China Technical University in Nanking. It was a very interesting experience.

Oh, I forgot to mention earlier, the original protocol for the visit to China dealt with hydropower only. I asked the State Department representative to include “hydropower and related water purposes,” which gave us a reason to look at navigation. The Corps group stayed three extra days after the others came home to look at navigation issues.

When I went back in 1985 I was asked to come to Beijing to discuss water transportation. I was given an invitation to survey water transportation facilities in China. I told them I would like to do it, but I was no longer a member of the government, I was a private citizen, and they should work that out with the Corps of Engineers. It never happened to my knowledge. That’s too bad since the Corps seems to have been circumvented, more or less, by either private enterprise or other government agencies, such as the Bureau [of Reclamation] in the dam-building arena.

I do think there’s a great need for the Corps over there on the transportation side. The approaches to the harbor at Shanghai need engineering attention. Inland locks, dams, and channels need to be reviewed and modernized. They need an overall water transportation system. I think the Corps has a role to play there when the political situation permits, and I believe the Chinese would like very much to have the Corps of Engineers participate. In May 1993 I was asked by the Chinese embassy here to arrange a meeting with the Chief of Engineers’ people to talk about getting the Corps back into China. Whether it will happen, I can’t say. I do feel that the U.S. government should at least keep the door open so if the right circumstances develop, the Corps can move in. The Corps’ presence would make way for American business.

I was able to convince the Secretary of Defense’s office that the Chinese may not need American help in engineering and design; they can do that. They didn’t really need our help in construction practices—they’d rather use their own labor-intensive system. But they really needed our organization and management techniques. That’s why I taught that summer.

My term as Chief was not the only one that dealt with China. I know that General Heiberg went later with Secretary Dawson.

Q: Last time we ended by discussing the program in Russia and the program in China, but those weren’t the only international programs that the Corps had going on when you were Chief of Engineers. Perhaps we could pick up talking about the program in Saudi Arabia.

A: Yes, I believe I covered earlier the philosophy for the international program and setting up the International Projects Office. The foundation for that idea really was the Saudi program.

Going back to the President Eisenhower days, the Corps worked in Saudi Arabia building an air terminal in Dhahran under an engineer assistance agreement. Later, when the Saudi Arabian government found itself with financial resources and the need to modernize its country, one approach was to re-institute the engineer assistance agreement. Under the agreement between the Corps of Engineers and the government of Saudi Arabia, in its more recent form, the Saudi Arabian government could develop a modernization program and finance it by depositing money in a facility in the United States against which the Corps of Engineers could charge its expenditures for the Saudi program. The important point is this major program costing \$19-\$20 billion was entirely paid for by Saudi money, not by U.S. money.

My personal involvement did not materialize significantly until I became Deputy Chief of Engineers in 1975, and, by that time, the potential growth of the program was predictable. The

director of Military Construction was responsible for the program even though, as I recall, the funds were managed through the Civil Works accounts.

On 1 July 1976 the headquarters moved out there as a new division, the Middle East Division. Colonel Gray remained as district engineer of the Riyadh District, and Brigadier General Dick Wells became the first division engineer. He was selected because of his solid, thorough, deliberate, and correct decision-making process-characteristics we needed for a new office during a turbulent period. Gray stayed a short while, returned to the States, and ultimately retired. Wells built up the Middle East Division and got it off to a good start.

Q: Was it important to have a general officer there?

A: It was critical to have a general officer there. It was the biggest program we had. The Saudis are quite sensitive to having top people. Also, making it a division in itself was important, but we must remember that the Saudi program probably was as large as the rest of the military construction program, and it was a long way from home. We also set up a division rear out at Winchester. A general was appropriate.

Q: Why was Winchester chosen?

A: Well, it was not accidental. The chosen site, not where they are now but where they went originally, was secure and had good communications once Bob Blakeley set up a satellite communications network to Riyadh directly from Winchester.

It was far enough away from Washington to protect the activities from what I would consider unnecessary visits and queries, et cetera. Several sites closer to D.C. were considered but none was as suitable.

As time went on, and almost immediately after I moved up to be Chief of Engineers, I met with the officer in charge of the Saudi military construction program, Prince Nasir Faisal. He was a major, very sharp, and I thought, excellent. During an early meeting I mentioned that while the program was big then, it would not stay big forever. I wanted the Corps to finish its work with pride and dignity, and I would like to try to predetermine a date for coming home if possible.

So I asked him if he would give us a flight path into the future, which he was unable to do. However, by asking that question when we did I think it alerted the Saudis to the fact that somewhere out there there would be a phase-down and that should be handled properly. Of course, that was a low-priority item at the time because we were so busy doing the job.

A couple of other things came up in the Saudi program. Our charter and our responsibility were to the Ministry of Defense and Aviation, and also to the National Guard. The ministers over there were possessive about people who worked for them. I offered to do a study of their water resources nationally, similar to what we've done in several regions here in the States. It was a very attractive offer, but we could never get the authority to deal with a ministry other than the Ministry of Defense and Aviation for reasons I don't understand. The Corps could have done it nicely.

So we concentrated on the Ministry of Defense and Aviation, and out of that program came some truly magnificent projects-no question about it. The headquarters of the National Guard is a monumental building, cost a couple of hundred million dollars. It was designed by Leo Daly and built by **DiMathis**, an American company with the Korean, Sam Whan, as a partner. It is a beautiful building. We had some problems with it, of course; you always do. Then we built the headquarters for the Ministry of Defense and Aviation itself, which is another monumental building, the headquarters for the Air Force, headquarters for the Navy,

all in Riyadh. I guess the first project we did there was the communication setup for Voice of America, but I was not involved.

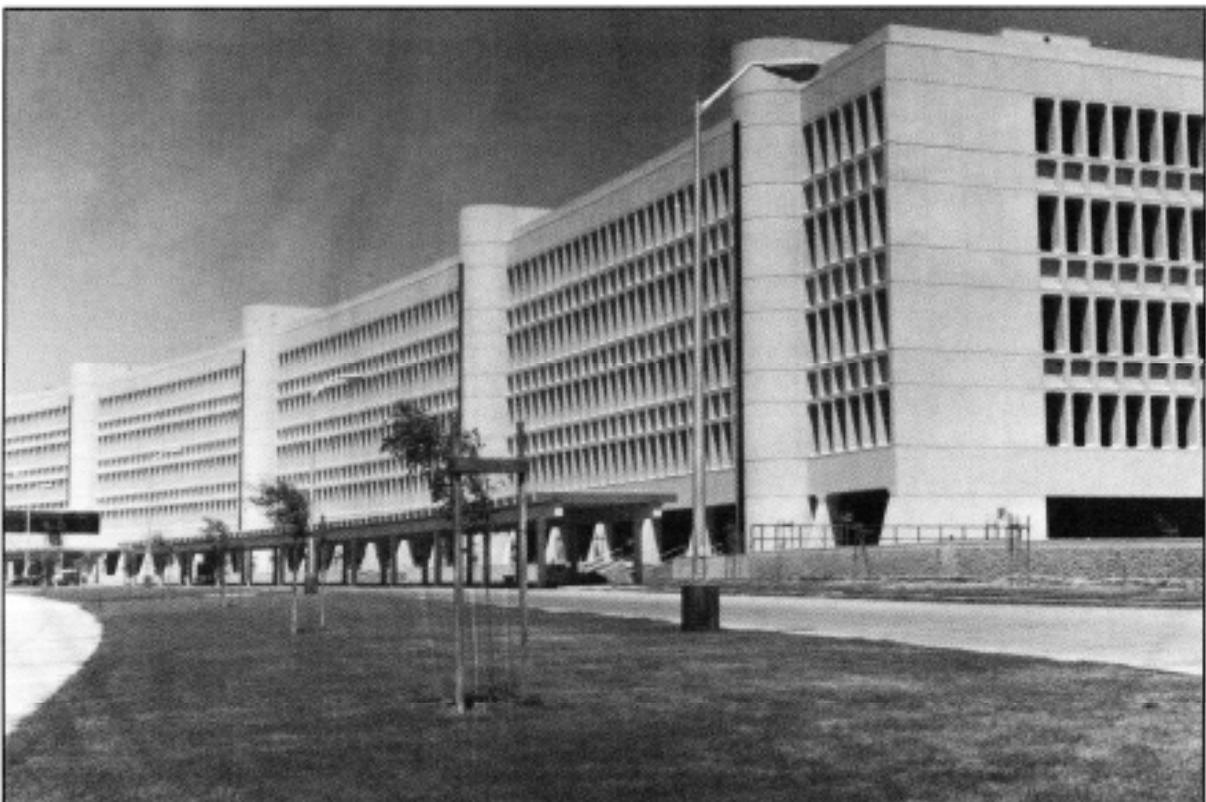
Then there was quite a bit of work in the west, Khamis Mushayt, Tabuk, and Jidda. Jidda District was formed, leaving the eastern area to Riyadh District. Later we set up the Al Batin District in King Khalid Military City. The latter alone was a multi-billion dollar, 70,000-person city, built in the middle of the desert. We did work for the Navy at Jubail and actually built a port nearby at Ras al Mashad to service the work at Al Batin So it was a magnificent program, and the Corps carried the American engineering and construction industry with it to Saudi Arabia.

Also, in the early stages American manufacturers were blessed because the work required furniture, fixtures, and facilities that were ordered by Winchester from U.S. suppliers.

Now, as with any program of that size, there were difficulties. The difficulties, in hindsight, were primarily with executing the construction, not the program. The only programmatic adjustment we ran into was with the National Guard. Prince Abdullah, who's now the crown prince, was then the head of the National Guard Bureau. While we did a lot of good work for him, the National Guard began to manage its own contracting and did not use the Corps after the first couple of years. I am not aware of any dissatisfaction other than they thought we were expensive.

**Q:** The internal politics of the Saudi government, royal family, is a pretty complex environment in which to work, isn't it?

**A:** Yes. Yes. The Ministry of Defense and Aviation was under Prince Sultan, still is, and he stayed up-to-date on the program. His staff included Prince Nasir Faisal, whom I mentioned, and other people in his ministry. This group and the Corps established clear procedures, so



*National Guard Headquarters Building in Saudi Arabia, part of the massive Corps of Engineers' managed construction program for the Saudi Arabian armed forces.*

it worked out well. That was one of the advantages of only working with one ministry. You had only to understand one ministry, as opposed to trying to figure out two or three.

King Khalid showed up at major events like the dedication of the National Guard Headquarters. At Al Batin, we built a guest home for him which he used once or twice.

It's too bad, in a way, that the American industry lost its preeminence in this program as other governments began to subsidize their construction industry. I think I've covered that already.

Q: Did you go over several times?

A: Yes. I was in and out of there several times a year. I happened to be in Saudi Arabia the night that the Camp David agreement was to be signed. Gerry and I were guests of Governor [John C.] West, the American ambassador to Saudi Arabia. That evening he was called away from our dinner party. Later I learned he had received instructions to tell the King that the agreement had been signed. There was not a great deal of enthusiasm in Saudi Arabia for the Camp David agreement, as I recall.

The next day I was in Egypt to do some work with the Suez Canal authorities and I was the guest of Chairman Mashour at his headquarters in Ismailia. The Egyptians were delighted with the Camp David agreement. There were parades and Mashour had to leave us also, but he went to celebrate. While we were there, somebody asked what the Corps was going to do about those two airfields, which leads us into the Israeli airfield project, although you haven't asked about it. Along with the Saudi program, this became a major effort of the Corps. Believe it or not, I didn't know anything about the two airfields when I was asked this question. I replied, "What airfields?" So I learned, sketchily, that the Corps was to replicate



*General Morris participated when King Khalid of Saudi Arabia dedicated the National Guard headquarters building.*

in Israel a couple of fields that were in the Sinai before that area was returned to the Egyptians.

Well, by the time I got home, General Bumell, the deputy, had gotten things well organized. He'd sent some people to Israeli already.

So that was the beginning of the Israeli job, the airfield job, which turned out, in my judgment, to be the most difficult single project during my term in the Corps. Before I leave Saudi, we should discuss a few lessons learned from the standpoint of contract management.

The Saudis would, of course, determine the program and they would approve the design. We had no objection if they suggested contractors who might bid on a job, but the Corps definitely objected to any influence being exerted by the Saudis on who was to be selected to do the job. Until very late in the program, that was never an issue. The Saudis respected that and we didn't have any problem.

When the King Khalid Military City came along, we had to select a contractor to build the infrastructure—the roads, the water system, quarries, et cetera—and then to operate and maintain those for the major contractors who were to build the facilities. The infrastructure contract was highly competitive and very expensive for the bidders to prepare proposals. After several iterations, meetings, and reviews, we derived a short list of contractors whom we wanted to go to the next go-round.

At the last review there were two critical issues: one was how to organize and manage the job and two was how to handle the materials going to the job site. The second point proved quite simple. The freight forwarder, whoever moved the materials from the United States to the project, would be responsible from the time they were picked up in the States until the time they were turned over to the using contractor at the job site. That meant through all the ports and in and out of the customs and then reshipped in Saudi from water to land, et cetera. That was a tough requirement for the freight forwarders. That allowed us to deal with the contractor because his risks were defined a little more clearly than if he had to pick materials up at the port.

The next question, though, was management. We wanted to be sure that the contractor had proven experience in managing complex projects. We had some excellent competition. We were just about to make the final decision when we got a call from the Saudis saying they wanted a certain U.S. firm to be allowed to bid on the job.

I objected to being told to give favored consideration at that late date and that it was a violation of our understanding that the Saudis would not try to influence the selection process. The fact is, I felt so strongly about it that I mentioned to the Defense Department that if the Saudis insisted on forcing this issue, that I would suggest that they find another agency to handle the Saudi program. The ship had already left the port, for all practical purposes, and there was no way to get this new firm into the system in any reasonable way. As it turned out, the president of the company came to Washington. I briefed him on the whole situation. I noted that there really was no way to get a new bidder at that point in time and still be fair. Actually I would have been happy if the timing were different. He agreed and asked that his company be withdrawn from consideration. That was the end of the problem.

The contract went to Morrison Knudsen for about \$800 million. I may have mentioned earlier, when the time came up two years later for renewal, Morrison Knudsen indicated they did not want to bid it. They felt they'd lost money. I asked them to bid since they were already there. They did. Sam Whan came along with a bid that was significantly less. Sam Whan is still

there, as far as I know. So it was another example of what I've already discussed, where American firms lost out. I really do think Mr. Bill McMurren, the president of Morrison Knudsen, put in an honest bid- t h a t is the amount he thought they'd need to be successful.

In contrast, when the Corps finished there were claims. Contrary to awarding a contract, I thought the Saudis should participate in the discussions relating to claims. Payment was often held up because of their questions, and if they participated in the negotiations to settle these claims, the chances are they'd be settled without delaying questions.

While we didn't want the Saudis involved prior to the contracts being awarded, I felt they should be involved in the close-out claims situation.

When we first got into the Saudi program, there were some morale and personnel problems. Ultimately we moved over a thousand people out there. Initially, our people were living in homes that had been procured from the market throughout the city. Don't misunderstand me, they were very nice homes, but they were scattered all over Riyadh. Our women couldn't drive, and transportation was difficult because the road nets weren't finished. It was just very inefficient and somewhat unpleasant for all, especially the women.

So we asked the Saudi officials to allow and finance us to build housing areas for our own people. That was done to include recreation facilities. The housing areas were to have **better-**than-average facilities for family-entertainment, playgrounds, tennis courts, et cetera. We may have been a bit extravagant, but I have no apologies. It was the right thing to do.

We built a nice area for the senior people called "The **Wadi**" including a larger home for the division engineer. The division engineer needed a little more space. He had some entertaining to do, and the houses weren't all that large anyhow. Besides, the Saudis expected the senior people to be better cared for-that was their style.

Morale problems lessened at once, and most people who went to Saudi loved it. They were often hesitant to go, but once they got there they loved it. I remember when we sent [Major] General [James N.] Ellis, whom I'd yanked around a couple of times earlier in his career. Mrs. Ellis did not want to go, but after she got out there she loved it. Really. The same thing happened, to some extent, with [Major] General [George] Robertson. He and his wife were happy too.

I look back on the Saudi program as a severe test of the Corps' managerial talents and capabilities. It was a successful program. Some people may say we should have stayed longer. Still, our goal was to export our talents and teach the Saudis how to do their own management-and they've done that.

Q: I wanted to ask you about that. There was an emphasis on training the Saudis.

A: Yes, absolutely. We never made any bones of the fact that we were going to be there as long as they needed us, but our intent was to come home. When we came home, to leave behind a capability that could fill in behind what we were doing. You always hate to give up a nice program, but when we'd finished our mission the Corps came home in good shape. Fact is, they had a ceremony to recognize the work. Along with General Clarke and selected key people, I was invited in 1988 or '89 to a very nice Corps' recognition affair in Riyadh and at King Khalid Military City. I've been back to Saudi several times since I retired and the Corps remains well liked. They'll never bring the Corps back in to do what we did before, nor should they, but they still call on the Corps for advice and help.

The only other incident in the Saudi program that I can think of was when Under Secretary of Defense [William] Clements thought the senior U.S. officer in Saudi Arabia, the Air Force

commanding general of the U.S. military mission, should be in charge of everything in that country involving U.S. personnel.

Having just departed Saudi Arabia, I was up in Brussels visiting General Haig's headquarters. Also, I had a very bad cold, but on learning of Secretary Clements' interest, I decided we had to get back to Riyadh. We were able to get a helicopter from NATO [North Atlantic Treaty Organization] to go to Orly, and fly from there into Saudi Arabia. Lieutenant Colonel Jack Clifton was with me. We had some difficulties because of weather, but all that worked out and I got back to Saudi at 0600 and went right to this meeting. At the end of his visit Secretary Clements decided not to make that change.

While in country, Secretary Clements dedicated some facilities for the National Guard and I was able to spend time with him. It was during that period of association and discussions that I think he decided not to make a change. That was a near thing because, while we would not have lost the mission, we could have lost control.

We had another little event which maybe shouldn't go in here but it was important and humorous in a way. General Haig had been replaced by General Rogers at SHAPE [Supreme Headquarters, Allied Powers, Europe]. In Saudi, of course, you're not supposed to drink alcoholic beverages. There was an arrangement made with the Saudi government which was well recognized and well managed allowing the Corps to import alcoholic beverages and distribute them within the U.S. compounds with the understanding that the whiskey would not go outside the compound and that we'd remove labels and break the bottles.

When the sergeant major of the U.S. military mission was replaced, he told his successor, "One of your most important duties is to handle the Class VI distribution." Well, the new sergeant major didn't keep that as close hold as he should have and the word got back to General Rogers. Rogers said, "Quit sending whiskey into Saudi Arabia." That decision threatened to be a big morale problem as you can imagine.

Fortunately, we had enough supply on hand that we could stop temporarily. Finally, I called General Rogers on the phone and explained to him the impact of his decision. So he finally said, "It's your problem. Solve it, but I don't ever want to hear about it again."

So there were two close calls in things that affected our program. We successfully survived Mr. Clements' initial ideas and also kept our spirits.

Q: It's interesting, the story you said about the Corps' getting out of Saudi Arabia. I interviewed General Bill Wray in 1987, and his objective, he said, and he was there at the close-out, was to get the Corps out, to get it out with its dignity.

A: Well, that was the policy.

Q: And to leave.

A: I'll tell you how that came about. Another good friend of mine, General **Parfitt**, had been governor of the Panama Canal, and when the decision was made by President Carter to relinquish the canal, the position of the governor and the canal company was immediately impacted. I felt that the Corps had been summarily dismissed from Panama. Although General **Parfitt** did a magnificent job in closing out his operation, we didn't want a similar event to happen again in Saudi Arabia. So we did start, years ahead, to plan a proper departure with the flags flying, morale high, and a fond farewell.

I'm glad to hear Bill Wray felt that way because he was a significant player in the whole Saudi situation. He deserves a great deal of credit for many other things including closing our offices when he moved to Europe as top man.

Q: That brings one follow-up question on this I wanted to ask. When the Mediterranean Division moved to the Middle East, it left the work in Europe in the hands of the Europe Division, EUD, which was a fairly new organization.

A: Yes.

Q: Did you have any reservations about that?

A: No. The Saudi Arabia matter was paramount. Med Division was busy in Sicily. About that same time an agreement was made for the Navy to take over the perimeter of the Mediterranean to a certain distance east, and Admiral **Islen's** people moved in behind the Corps in Sicily and lower Italy under this new agreement. The Army effort, which went from Med to Frankfurt, wasn't as big as you might otherwise have thought.

While the Europe Division, as such, was relatively new, we need to remember that an engineer command under Generals Koisch and **LeTellier** existed before EUD. I don't recall having any hesitancy about that. Anyway, that's what we did and it worked. That's the key thing.

We've spent a lot of time on Saudi Arabia.

Q: You talked about the discussions of the American military command arrangements in Saudi Arabia. I wondered if that had come up, the whole idea of putting the Corps' effort under the American armed forces commander over there. It would be sort of logical that that idea would come up, I guess.

A: Well, it does. First, he was the senior man. Actually the access to the United States government through the military mission was cleaner than in our assistance agreement. It was an idea that seemed to have some promise, but the timing would have been serious. Anyhow, Secretary Clements decided not to do it and I was happy. Also, about this time was another somewhat unfortunate decision here at home. Our Congress included the engineer assistance agreement work as part of the foreign military sales effort. That meant that Congress got in the act on all the work that was done under the engineer assistance agreement.

Q: Turning to the other big international program when you were Chief, the Israeli air base program.

A: Well, as I said, that's the toughest specific challenge we had. Many complex factors made it tough. When this whole project started, I suggested or decided that we'd send a public affairs person to Israel to be on the ground during this whole process. As a result of that, a book has been written. I don't remember the title [***Building Air Bases in the Negev***], but a Corps' historian [Frank N. Schubert] wrote it so you can find it. The book's okay; however, it was based on a perspective below the Chief of Engineers' level; therefore, some assumptions or conclusions were off target when drawn about my thinking and decisions, but I don't think I should belabor that point. The book is a worthwhile read.

The key problems with the Israeli project were:

First, there was a fixed deadline to make the airfields operational or the Israeli air force would be grounded.

Second, there was less money appropriated by the Congress than needed, so the Israelis had to provide the last \$240 million. This meant that every dollar saved up to that amount was their money.

Third, there was no logistics or base upon which to build and there was no labor market to draw upon.

Fourth, we needed a cost-plus type of contract because there were so many uncertainties.

If there was a fifth, it would be that the plans for the existing airfields in the Sinai, which we were to replicate, were in Hebrew and the as-builts were very incomplete.

So there we were. We didn't have any design, we didn't have a logistics base, we didn't have a labor base, we had a very tight deadline, the money was short, and so on.

As I mentioned, General Bumell had begun to gather critical data by sending a team to Israel to evaluate the situation. There were, however, several key and basic decisions to be made. One was the money. First off, the Congress of the United States did not act immediately on the Camp David agreement. In other words, it was three or four months before they appropriated the money to execute the program. We really couldn't afford to lose three or four months in our planning. Then, we had another problem. Air bases were an Air Force-type program, but the Corps was going to do all the work. I was convinced the Corps needed the money, and we took the position from the outset that we had to control the money. The Air Force insisted it was their program and they wanted the money in their budget. This grew into a very interesting and crucial issue.

To me, it was a critical problem. If we didn't have the money, we would not have the control we needed to do the job. Well, the thing finally got up to the Secretary of Defense's office. Mrs. Shay was Assistant Secretary of the Air Force, as I recall. She was the senior person from the Air Force present at a meeting. She appeared with her group. I was alone. Mr. McGiffert was the Assistant Secretary of Defense who dealt with this project. I'd known McGiffert when he was the Under Secretary of the Army. As soon as the meeting started, I think he realized that I was very serious about solving the money matter correctly. Fortunately, General Graves, who had been my deputy in the Corps, had become McGiffert's military adviser. As we all know, General Graves is very perceptive.

After considerable discussion, Mr. McGiffert indicated he didn't want to have to solve this problem by a directive and for the Air Force and the Army to come to some understanding. So Graves put a proposition on the table that the money would be put into the Air Force budget with the proviso that it would be passed through without change directly to the Chief of Engineers. That's what we did.

So that was the first, I think, fundamental decision that had to be made. That was not an easy decision but DOD got that right.

The next decision related to the kind of contract we needed. As it turned out, the Military Programs staff devised a completely new type of contract, the only one of the type we've ever had and may never have again. A consortium was to be formed wherein the construction contractor would be the principal, but he would have to put on his team a well-known, highly respected design engineer firm. We had to do a fast-track job by designing as we went along. These aspects, plus many other uncertainties, dictated a cost-plus contract. We just couldn't identify all the risks, particularly since we didn't have the plans and specifications. Still, we

had to start work if we were going to get this thing done on time. By the time Congress got its money straight, we had less than three years to do a five-year job.

We looked around the Corps for people who had cost-plus experience and we found three people. There must have been more out there but we could only find three, and I happened to be one. I must say here I really gave thanks for Fred **McNeely**—a rock in this project. Those who have dealt with cost-plus know that it's a complete flip on the normal fixed-price contracting officer and contractor responsibilities. Instead of the contractor being responsible for doing the job within a fixed price, under a cost-plus job the owner becomes responsible for managing the contract to be sure that the costs stay in line. Cost-plus requires stronger control.

Then we had to select a contractor for each airfield. We couldn't use a contractor that was working in Saudi Arabia. We ended up using Guy F. Atchinson and Perini. We were extremely fortunate to have two such outstanding contractors. We actually started work almost on a handshake because we couldn't definitize the contract till we knew more about the details.

We finally got the contract definitized in January 1980 or about eight months after we started work. In the meantime, the two contractors spent well over \$100 million and I don't think they spilled a dime. I really was impressed by their patriotic, All-American, get-the-job-done spirit and their reliance on the Corps to treat them fairly.

On 14 July 1979 we dedicated New **Melones** Dam. Guy Atchinson built it. I attended the dedication with Joe **McNabb**, president. Joe came up and said, "Jack, this thing's not going to work." I thought he was talking about New **Melones** Dam. He was talking about the Israeli airfields. I said, "Why?" He said, "Well, I can't get any answers." I asked him to provide the questions. I took 14 questions back to Washington on Saturday. On Tuesday morning I called and we gave him all the answers. He said, "Well, I guess we can get the job done if we get that kind of service." That reinforced the need to have excellent control and management and led to another key issue-how to manage this job.

I mentioned earlier the goals and policy to keep the Corps headquarters out of the operations business. I thought the headquarters had plenty to do in the policy and the programming arrangement. Based in part on my own experiences in Labrador, we selected North Atlantic Division as the operating division. Their job was to get the job staffed, manned, get the materials rolling, get the contracts set up, et cetera, et cetera. My intent was that whenever the center of gravity of the work moved to the field, in other words when the contract was awarded and we had the staff in place and everything was working, then we would remove North Atlantic Division by setting up a small-division type of operation under a general officer stationed in Israel. In the meantime, I was satisfied a colonel would be satisfactory, especially since he was under Major General Jimmy Johnson, the division engineer, North Atlantic Division. When General Johnson came down to be deputy, Major General Ben Lewis took over. There was considerable discussion later as to whether I should have sent a brigadier general at the outset directly to Israel.

Ben Lewis did an outstanding job definitizing the contract. I don't think anyone else could have done as well. He ran the project with firm control out of New York, which caused a certain amount of tension at the other end. Sometime in the spring of 1980 Bill Wray, General Wray, came to me by memo saying, in effect, "We've got to do something about the organization. We ought to put a general out there." I said, "Well, if you do, we're going to take North Atlantic Division out of the net, and I don't want to do it until we are sure it won't be an operational burden on OCE." He indicated, "We'd better do it." So we picked out John

Wall, who'd just made the brigadier general list. John was in school getting a doctorate in law and not available until late May. He was exactly the right man. I had known John in many earlier jobs and there was no one else I really wanted to send. So we sent him. He arrived in June.

We then began to extract North Atlantic Division. That created a certain amount of tension, too. General Lewis didn't want to give up the job, but the time had come to do it. Even so, we didn't take him out of the net until September. I had to give Wall time to get his feet on the ground. I was supposed to retire on 30 June 1980, but because of this project General Meyer, Chief of Staff, allowed me to stay on until the end of September. So I went there in August to be satisfied Wall and his people were ready. The book mentioned earlier has quite a bit of discussion about that whole scenario of the general going to Israel and taking Lewis out of the net and so forth. My actions were simple and predictable. I followed the original goal of keeping the Chief's office out of the operations business. We could swallow up 40 or 50 people just running a job, at the expense of policy and programs. It worked.

We sent the best people out there. I found three of the Corps' best colonels-Don O'Shei, Jack **Gilkey**, and Dick Curl-and they were the first three colonels assigned. Jimmy Johnson was given the choice of each of those for the projects and for running the office. He chose **Gilkey** to run the office, and he put **O'Shei** and Curl in the projects-good decisions that fit the persons involved.

In executing the job, it took a while for things to settle down. The labor market problem became significant. Perini used Thais, who proved to be great equipment **people**, but their upper body strength was low, so they didn't do as good a job on roofing and heavy lifting things. Perini, I believe, had to have three or four different mess halls because of the different types of food. The other contractor used the Portuguese and they were infiltrated with some Communists. They went on strike, which had to be straightened out.

In the end, the Corps built two beautiful airfields. I, of course, had retired in the meantime. It's a real credit to the Corps and the personnel in the Corps that they were able to get that job off and running and finished ahead of time and that the budget process worked well. I think it ended up costing \$1.24 billion, instead of \$1.2 billion. We had a \$40 million overrun. The fact is the Israelis got all the equipment at the end of the job. I believe they got their \$240 million back in other ways. There were changes to the job also. Quality control was tough, cost accounting was difficult, as was scheduling of the work because of the design issue. All of those things and many more created a host of problems and difficulties at the project level.

Q: You mentioned logistics was a problem.

A: Ben Lewis told me early on in his term that the big bugaboo was going to be procurement. He was right. Procurement was the crunch item.

Personnel was a problem, too, in a way. The Corps did not have a team in place to send out to do the job, so we made some ground rules initially. One, we were only going to send about 100 Americans. Everybody in the Corps was busy when this job came along. We didn't have people sitting around doing nothing. So the idea was we'd send a limited number of key Corps personnel and hire a construction management firm to supplement this staff. Lester B. Knight became part of our office. The number of Corps employees was set simply because we wanted to keep down the number of people we took out of the system and also we thought we could find 100 key people who were well qualified.

They had never worked together. Many knew each other, but they'd never worked as a team. The rules of the road were different. So getting the office organized was a tough job. Jack **Gilkey** had the task. The two outsiders, the U.S. Air Force and the Israelis, became very impatient. They wanted a lot of things to happen more quickly than was the case.

In hindsight, I don't think we protected **Gilkey** enough. **Gilkey** was a colonel; the counterparts were brigadier generals. His flank was overexposed. Instead of being able to concentrate entirely on getting his office organized, he had to deal daily with these externalities. As a consequence, I sent Brigadier General Max Noah from Huntsville to set up the management information systems and to help Jack. Max did his job. The contention was that if we'd had a general out there to deal with those other generals, it would have made all the difference in the world. I don't think it would have made much difference because the initial distractions for the project manager would not have changed. I admire **Gilkey** for his performance, perseverance, and objectivity.

Start-up was a major problem. Then General Lewis had problems with some of the Corps individuals and he wanted me to replace them. I finally had to tell Ben, "I don't know where we're going to get better people. We've sent the best we had. Unless there's some disciplinary problem, our best bet is to train those into a team rather than sending new people out." I went to Israel in January 1980 and told our people that I would be back in August and left four or five things to be done. Many were nervous about losing their jobs so I announced to the groups that, "absent some difficulty with the Israeli government or some disciplinary problem, you're the people who are going to get this job done." Afterwards, our people settled down.

I went back in August. John Wall was there by this time, and the management information systems were beginning to work.

To emphasize Jack **Gilkey's** problem, I found that every time I went to Israel I had trouble with the Air Force and the Israeli generals assigned to the project. They kept hammering on all the things that were too slow or going wrong with the Corps' operation. They were tough and I rarely had a chance to say anything. One day we were supposed to go see the Minister of Defense, Mr. Ezer Weizmann. After lecturing me for about 30 to 40 minutes, the Israeli brigadier general indicated we had to leave. I asked where we were going. They indicated we were going to go see the Minister of Defense. I said, "Hold it. Since I haven't had a chance to say anything, I am sure we are going to be a little late."

When we got over to the minister's office I raised the relationship problem. I said, in effect, that he had bought a Chevrolet and now we were going down the road about 50 miles an hour and somebody decided he wanted a Ford. If you want to stop long enough to let me off, it's okay, but if we're going to continue we'd better figure out how to work together.

Mr. Weizmann acknowledged the Israelis could not do this job. He said words to the effect that he didn't think anybody in the world could do it except the Army Corps of Engineers. That's what he had asked for, that's what he got and was going to keep them. He gave the Corps a big pep talk, and that was the end of that. So when it's all said and done, the Israeli airfield job was, I think, a great challenge to all the key people involved. Everybody had to work hard, and they did and I include all the players-U.S. Air Force, Israelis, Corps of Engineers, and contractor personnel. The level of concentration and loyalty of the Corps' group in Israel sets a standard, in my judgment. In spite of all the pressures, all the difficulties, they put this job together; and they got it done on time, generally within the budget, and with

high-class quality. That was under great pressure, not only externally but internally. So you have to admire the results, and then you have to compliment the people that got us there.

There was no adverse publicity. You didn't read adverse comments about this job in *Engineering News Record* or in the *Wall Street Journal*. Most jobs of this nature attract public attention. This one didn't. So I'm pleased with the way the Israeli airfield job came out. I am especially gratified to General Bill Wray, Fred **McNeely**, and Lee Garrett of his office for their excellent management of the entire project.

Q: One follow-up question related to this and having to do with the cost-plus contract. In the Corps' past there had been some very bad publicity associated with cost-plus contracts, so that was an additional pressure on the organization.

A: Yes. The circumstances that normally lead to using cost-plus usually generate problems. The reason you go with cost-plus is because of uncertainties. You want the government to protect itself rather than have the contractor put into his bid exorbitant amounts of money to cover the known risks and some he can't foresee. So in and of itself, a cost-plus contract has controversial characteristics and uncertainties, but there's definitely a place for it. My philosophy is that the best answer is fixed-price. If you find there are enough uncertainties or other specific reasons to warrant a different type of contract, whether it's cost-plus or **fixed-price** with incentive or whatever, then you adopt a deviation from the standard justified by specific situations.

Q: Let's begin this morning by talking about the MX program that appeared on the horizon during the Carter Administration.

A: The MX was an on-again, off-again program because of discussions about whether it would be built on a track that ran across a large part of a country, a mobile system, or whether we had multiple mini-sites, the mini-MX program. The Corps' role would have been to supervise the construction of whichever plan was finally adopted. A large area of the Southwest had been identified for the mobile train, and our greatest efforts were oriented towards organizing to do that job.

We used the lessons learned from the original ballistic missile program which was placed under an existing division. Soon the new missile program was taking so much attention that the division couldn't execute its basic program efficiently. In that instance, the Corps decided to set up the Corps of Engineers Ballistic Missile Command. Some slippage resulted as a result of the change in the organization and management.

We didn't want to repeat that situation. On the other hand, to get started, we needed to put the organization and management and a certain amount of the startup under one of our divisions. The South Pacific Division was chosen with the Los Angeles District as the primary management office. That's also the way the ballistic missile program started. In this case, however, the start-up plan for executing the MX program was to describe the circumstances which, when fulfilled, would indicate that the time had arrived to set up a separate command.

We didn't want the change-over to happen as a result of deficiency in performance. Rather, we wanted to have a preprogrammed plan to initiate the new MX construction command and relieve the division. From the outset, the South Pacific Division knew that it was not going to build all the MX requirements.

General Delbridge, division engineer in San Francisco at that time, was personally directed to develop such a plan for handling the MX program.

When I retired, the MX program had not materialized. There was a great deal of attention given to it, both in the Congress and in the Executive Branch of the U.S. government, which included the Corps, of course. Ultimately, it was canned and now it will probably never be built. Still, the Corps was well placed, if it had happened.

You know, the military program was fragmented over a large number of military installations throughout the world. Consequently, individual projects often were not sufficiently substantial to warrant particular discussion here. Exceptions would include the Israeli airfield work and portions of the Saudi program--also, programs such as housing, military training facilities, special warehouses, and shop facilities. The projects within the programs were usually distributed over two, three, a dozen, or three or four dozen installations.

Some programs stand out in my recollection, for example, the hospital programs. Every hospital was tough, so a special management group involving medical and Corps people was established. Hospital construction was a major management challenge within the Corps.

Q: Most of these were renovations rather than new constructions?

A: There were some of both--a new one in Colorado, a rebuild in Hawaii. Fort Campbell got a new hospital. There were several new hospitals. I don't remember all of them now, but then, as you say, there were a lot of rehabilitations. Walter Reed was the predecessor of most of the ones I'm thinking about, and we learned enough at Walter Reed to help us with the rest of **them**.

The postal program was winding down. The point I'd like to leave on the military is--it's not that there wasn't a large program, it's not that there wasn't a lot to do, it's not that it didn't take a lot of **management**--it's just that with specific exceptions, the program at any one location did not provide multimillion-dollar structures.

Q: Wasn't there a particular problem with facilities in Europe?

A: There are two parts to this subject. One is the facilities engineer business itself. General **Bachus**, as I think I've already mentioned, became the director of Facilities Engineering in the Chief of Engineers' office in a move by General Gribble to elevate the importance of providing and maintaining our soldiers' facilities.

In conjunction with that, we started the one-stop shopping concept mentioned earlier, where any district could support any commander who called up and asked for help. That added a lot of momentum. We did reduce the **backlog** of maintenance repair here in the United States.

A singular issue was the European housing facilities for our soldiers. General Cooper was deputy commanding general, U.S. Army, Europe. He became particularly concerned about the housing situation for soldiers and proceeded to focus attention from both the command and engineering approaches. This issue arose while I was deputy chief as indicated previously, so a program was devised to upgrade the facilities for our soldiers, not only the living facilities, but the functional facilities--in Germany especially.

Once the Congress became aware and started the funding, there were significant improvements. It was a big program which our Europe Division managed. There, again, it was fragmented. There's no single place that stands out like an Israeli airfield or the Saudi program, but as a program it was especially important and valuable.

One other item in the military area is engineer equipment. As a second lieutenant in World War II, I used a D-handle shovel and a D-7 tractor. I noticed the second lieutenants in 1976 still had a D-handle shovel and D-7 tractor while modern sophisticated equipment served the

rest of the Army. The Army engineer consequently did not have the mobility to keep up with the troops he was expected to support.

The entire time I was the deputy chief, we had an ongoing effort to get the UET, the universal engineer tractor. Then it was the ACE [M-9 ACE, armored combat earthmover]. That's what it finally came out to be, I believe.

As Chief of Engineers, I only had staff input, so the real momentum resided in the commands, the Army commands, not with the Chief of Engineers. The Chief of Engineers' office played a principal role in getting the top leadership of the Army to recognize this deficiency and ultimately have it satisfied.

Later General Kern, while CG at Fort Belvoir, advocated and got the E-Force moving. Now we have an engineer brigade instead of a battalion in the infantry division. That was an important move. General Kern deserves credit for his leadership.

Then there was the problem of mine detection. Having been in Vietnam, no one was satisfied that we had a good way to clear a minefield. The old-fashioned method was good, but it was just so slow and risky. So we were always looking for new methods. We had the flailer, an attachment to a tank. Not a bad idea, but it had to work hard to get the job done.

That problem really has not been totally solved to date. In the matter of combat equipment, I think mine detection and minefield breaching has to remain a front-burner item, particularly since, as we learned in **DESERT STORM**, mobility is so important. Breaching minefields remains a vital tactic and a major command concern.

I remember going out to the Engineer Topographic Laboratory with General Rogers, the Chief of Staff, and being given a demonstration on how the Pershing could identify on ground what had been programmed into its guidance system, and we were trying to develop water purification and treatment facilities so we could have small amounts of water quickly for the individual soldiers and larger amounts for large units.

So the whole set of combat engineer equipment being upgraded should always be a continuing effort because times and requirements change. In my day, it was mostly the ACE and the minefield equipment.

**Q:** Bridging equipment probably was one.

**A:** Bridge equipment, of course.

#### **Chief of Engineers: Civil Works Projects**

**Q:** We've discussed a lot of the military projects when you were Chief. Let's turn and discuss the civil works projects and issues while you were Chief.

**A:** Before we go to specific projects, we might set the stage a little bit by reviewing the national issues that impacted on the public works projects.

There really were a couple. One was the environmental program, and the other was the programmatic effect of having filled so much of the nation's water resource management needs. So we had this national movement legislated in NEPA, superimposed on a program which was declining in any case.

I've written and made so many speeches about how we got into the environmental priorities during the 1970s that I really don't feel that we need to repeat them in detail now. There's no



*General Bernard Rogers, a classmate of General Morris at West Point, visited the Engineer Topographic Laboratory when he was Supreme Allied Commander, Europe. General Rogers is second from the right and General Morris is third from the right.*

question that as our country grew, used more and imposed greater burdens on our natural resources, we would have to take stock of that growth and our development attitude.

The evaluation was precipitated, at least accelerated, by the environmental movement. The environmentalists who raised the question of the destruction of our resources and the ensuing long-term effects precipitated a change in our nation's policy. NEPA and subsequently Section 404 of the Clean Water Act amendments are evidence of their influence.

Section 404 put the Corps of Engineers in an ambivalent position. On one hand, there was a great pressure on the Corps to operate its business in accordance with the new policies, and that put numerous projects under close scrutiny. On the other hand, the Corps of Engineers was placed in the position of having to monitor and approve development by others in navigable streams and wetlands.

Those same rules gave project opponents a basis to challenge the method of satisfying them. Of course, everybody knows the lawsuits and all the stories about the snail darter, the Indiana gray bat, the striped bass, the eagle, the black-footed ferret, the peregrine falcon, et cetera.

One reaction to the constraints on construction was to find nonstructural solutions to various problems. As already covered, the Corps became the frontrunner. As early as 1971 we began to discuss ways to solve the drainage downstream from Chatfield Lake through the small residential community of Littleton, Colorado. Ultimately, legislation was adopted to use open land as a nonstructural solution to this drainage problem.

Soon general legislation was passed--Section 22, as I recall, of the Flood Control Act of 1974. One of the better projects was Indian Bend Wash, which maybe we'll talk about later. It's in Scottsdale, Arizona.

So when you talk about projects in the public works area and even in the military arena in the 1970s, you really have to place them against the backdrop of the environmental and regulatory programs in effect at that time.

The major programs that had been put into place by the Bureau of Reclamation, the Corps of Engineers, and to some extent, the Department of the Agriculture, but primarily by the Corps of Engineers in the 50 years leading up to 1970, had resolved a high percentage of the major objectives in developing American water resources. By 1975 only a few dams for hydropower were under construction. Flood control was fairly well in place as was the transportation system.

So a good question was, "What's left to do?" Especially in view of the environment and the other constraints. Should the Corps change its basic orientation in the public works arena from major construction, water resource development, to some other activity? To better answer that question we analyzed each function for which the Corps had a major role-hydropower, navigation, water transportation, flood control, water supply-to identify the need throughout the country.

Congress authorized us to make two studies - the national hydropower study and the national waterways study. The waterways study had begun while I was still director of Civil Works. I also had hoped to have a similar study made on the national water supply system.

The standard in those days was that the beneficiary of a project should pay. For example, water supply became a local responsibility as did local flood protection. As a result, the water supply study was not undertaken at the federal level. The hydropower study involved both high-head and low-head dams and small projects.

One year General McGinnis, as director of Civil Works, and I went to New Hampshire to inspect a project. We drove by a mill on a small river and noticed that there was some kind of small electrical facility there. We stopped by, and sure enough, the owner of this old fabric mill had installed a small turbine on a low-head dam. It was making enough electricity to run his plant. We both wondered how much more of this was going on around the country. Low-head power was getting to be a subject of great discussion.

Earlier, the Corps had installed an inclined turbine at Webbers Falls on the Arkansas River project. We felt that if we could get a horizontal turbine [run of the river] in the Mississippi below Lock and Dam 27 we could generate considerable energy.

In spite of engineering problems, there was big interest in low-head dams. So the director of Civil Works and I decided to have a conference on this subject in Washington in 1979 at the Hilton Hotel on Connecticut Avenue. We were joined by the Energy Department, and we expected to have about 300 people.

We got about 1,200 from all over the world. An unbelievable success. The Corps ran the next one two years later. Then because of instructions from above, I'm not sure where, the Corps was not allowed to plan that conference anymore, I'm sorry to say. Fortunately the hydropower conference is still continuing under the auspices of the American Society of Civil Engineers and remains quite successful.

Well, back to the basic point. The hydropower study indicated that we could easily more than double the present hydroelectric power output in the United States by improving the efficiency of turbines in our existing projects, adding turbines to existing projects, and developing certain low-head projects. That was a good report. It hasn't been executed and probably never will be since the energy situation has improved. The need for the hydropower may have diminished but there is, in this country, an opportunity for increased hydropower.

On the navigation study, as discussed earlier, you recall, while director of Civil Works I asked that we develop a first-class water transportation system for the United States.

We needed to determine standard shape and size of a good waterway. We had 9-foot channels, 12-foot channels, 600-foot locks, 420-foot locks, as I recall-the depth over the sill varied, as did the radii of curvature on curves. In other words, the criterion varied to the point that we needed a standard against which every project would be designed.

We also felt that we needed to know a little bit more about the movement of the traffic and the relationship between the waterways and the trains and the highways. Where were the future tonnages going to come from on the waterways, et cetera?

Well, that was a good study. Unfortunately it became quite involved, and I am not sure it answered the original question and produced a simple drawing that showed the waterways, where we could extend them, which ones we could get rid of, and a cross-section of a properly designed channel, et cetera.

The next thing, then, was flood control. So I asked simply for a list of the 10 or 20 worst flood conditions in the United States. It turned out we didn't have a great number. The Santa Ana River in Los Angeles was number one on the list. That's being fixed now. We always knew we had trouble on the upper Mississippi if we had floods that exceeded the design plan. Sacramento also has a flood risk of major proportions.

Overall we had a good look into the future, and it turned out there wasn't all that much out there. We had to finish up what we had, and there were only a few new projects. Basically, it told us that the public works program as we've known it all these years was changing. It wasn't over, but almost, and it was changing. That meant that the Corps should think about other things.

While all this was going on, you realize, there were constraints being placed on our personnel strength. Going back to my days as director of Civil Works, I did not think the Corps of Engineers should perform any functions that could be performed by the American business community. The federal government shouldn't be operating hopper dredges if we could find companies that could do the same work and could pay them to do it. Economics are involved, but the principle is okay.

Among the more "political" efforts was the program to privatize the hopper dredging activity of the Corps. Following visits to the Corps' dredging program in the Northwest and along the Southeast and Gulf coasts, I began to realize private companies could do the job. Earlier the Corps had privatized the pipeline and barge business, so a precedent existed. The impetus to move came when severe personnel cuts were imposed on the Corps' workforce.

Even so, there was considerable resistance from within the Corps and surprisingly from without as well. The dredging industry was very skeptical of the Corps' intent and was not anxious to invest millions of dollars in building new dredges without some assurance that work would be forthcoming. Another obstacle arose when plans to upgrade the Corps' ancient dredge fleet became known.

These items generated great pressure on the members of Congress who dealt with water, transportation, environment, and to a lesser degree operation of the ports and waterways. The debates went on for months. Mr. Robert Losche was the lobbyist for the dredging industry, and I should add an extremely effective one—probably the best in the business.

Finally, with much input from Bill Murden, I went to see Senator [Bennett] Johnston from Louisiana who was responsible for public works appropriation in the Senate. Bill went with me and we outlined a plan which would satisfy most complaints and concerns. Basically the Corps would reduce its existing dredge fleet of some 24 to 26 hopper dredges to 5 or 6, including 3 new dredges to be authorized. As part of this legislation, the Corps would guarantee the commercial dredge fleet some 20 million cubic yards annually. This amount was several times greater than their capacity.

I may have the details off a bit, but the proposal was adopted, passed, and implemented. The American hopper dredge industry was soon developed, the Corps saved spaces and dollars and also received three new **dredges**—the *Yaquina*, *Wheeler*, and *Essayons*.

I also felt, and still do, that we could privatize the operation of our waterways systems and our hydropower plants. There are plenty of hydropower plants being operated in this country by private industry. Of course, you like to have your own **people**, and there is resistance within the family to doing those things, but when you're looking for new missions and you have to cut man years, how do you man new opportunities? The new missions are the future of the Corps, especially since the old ones are drying up rapidly.

Those background conditions affect specific projects. Among specific projects, I guess we should start off with Lock and Dam 26, which has been covered in detail as director of Civil Works and as deputy.

I remember clearly how much time and effort went into the wording of the authorizing document. We ultimately got authority and proceeded to construct the first lock and a new dam. We had been working on the project since 1972 or 1973 when we finally got everything back in place, and I believe in 1976 we had the groundbreaking.

So Lock and Dam 26 was a landmark, a defining moment, because it threw out the old authority basis for all the work we had done on the Ohio system. It meant, from now on, if we changed the capacity, we had to get new authority. It also brought into play the effect of increased traffic on the environment. Lock and Dam 26 was, in fact, the most important lock in the river because it was the primary bottleneck for the **traffic** on the upper Mississippi.

As discussed earlier, Joe Tofani and I had talked about the 1909 authority, and we had concluded before the judge's decision that we had stretched our authority. The Corps' interpretation was if you're going to spend millions to replace something, why not replace it to modern standards? That was not the question. The question really was, "What did the words in the law say?"

The answer to that question set a tone which showed up in the Tennessee-Tombigbee project. That project, which had been in the works almost a hundred years, was well under construction when challenged by the Izaak Walton League and the Louisville and Nashville Railroad. I think it was called L&N.

We were challenged on two bases. One, the Corps did not have the environmental impact assessments in good shape, and two, the Secretary of the **Army** lacked authority to make

certain changes. Because of my long background on this project, I ended up testifying. The Tennessee-Tombigbee was a hot project for almost my whole time in Washington.

I testified over a two-day period for 11 hours in Greenville, Mississippi. I think I'm the only Chief of Engineers who ever testified in court. I had been with the Tennessee-Tombigbee Waterway problem as director of Civil Works, deputy, and Chief. I had signed all the papers, one way or another, and I probably knew more about Tenn-Tom than any other senior person. I couldn't send somebody else because I felt I owed it to the Corps, and also, I was the one that knew the most about it.

To prepare, I asked that we set up a straw court. Mr. Seltzer helped me with that. He had people on each side of this issue in my office. We spent a whole day listening to the charges and the defenses, trying to get a feel for how the thing might go.

Ultimately, we did a good job. The judge concluded the plaintiffs had dilly-dallied around and waited too long to raise their protest, but the fact is that we had presented our case very well. I think, on balance, and even later in my discussions on the plaintiffs' team, the Corps was credited with having satisfactorily justified its actions.

There were two things that I think are relevant. One is that General Itschner, while he was director of Civil Works and later Chief of Engineers, had said openly he didn't think the Tennessee-Tombigbee project was a worthwhile project. I've talked to him since then. He indicated that now that it's built, he would not argue it, but at the time he just didn't think we should spend the money.

When I was district engineer in Tulsa, we had eliminated one of the three locks on the Verdigris River. The money we saved on that lock gave us enough funds to extend the head of navigation to a more favorable location.

That was all done with a general design memo. We presented this change to Congress in the annual budget, but we didn't go back to Congress to get it reauthorized. The history of various decisions in the past, General Pick's testimony, and all the rest, supported such decisions and were helpful in the Tenn-Tom authority debate.

Another issue became very sticky when one of our civilian employees in Mobile District had prepared a memorandum concerning an annual budget-it had to be about in 1975. He indicated the project was going to exceed a billion dollars and that he thought that, for political reasons, we should leave the budget item somewhat below a billion because he believed the Congress would react adversely to a billion-dollar project. That piece of paper was unbeknownst to me.

When the project came up to OCE at over a billion dollars, the annual budget had been finalized in the Congress. I personally went to the House of Representatives and to the Senate and explained to them that the newest total estimate was over a billion.

The total cost didn't affect the funding for the next [budget] year. It was, however, a number that impacted future project appropriations. The committees of Congress decided that they'd talk about it in the hearings, but they wouldn't change the budget, which was at the printing office, as I recall. That was done as an administrative expedient because of the timing.

Well, during the discovery process for the trial, the mentioned memorandum was located, and immediately the Corps was accused of withholding information from the Congress. Whoever wrote that memorandum all of a sudden became the most important man in the Corps. He had more authority and knew more about the world than the Chief of Engineers or anyone else. This memorandum was held up as an indication that the Corps was devious in its business.

Frankly, if you read the memorandum and knew nothing about my discussions with Congress, you'd come to the same conclusion.

Shortly after the case was settled in court, I got a call from Senator Stennis stating he felt the Senate's Public Works Committee was all over the Corps about withholding information. So I had to go to a special hearing. The chairman was Senator [Daniel Patrick] Moynihan of New York. His members were Senator [Alan] Simpson from Wyoming and Senator [Pete] Domenici, from New Mexico. Domenici was, to me, the most formidable person because of his deep knowledge of the money situation. He was really the money person. Senator Stennis excused himself from the hearings. I had gone over there with two or three people, and I had all the usual backup books for a hearing. I never opened a book. I did not have to because, having just gone through the trial, I was really pumped up with information.

Well, they grilled me for about two hours, and the staffers kept feeding questions up to Moynihan and Domenici which I'd answer promptly. I told them about coming over personally, et cetera. Finally, Domenici apparently said, "That's enough," and they knocked it off, but it was a grilling. Senator Moynihan was very complimentary afterwards. He told me that he was pleased with the hearing, and he thought that we'd done nothing wrong. As far as he was concerned, he wouldn't question the integrity of the Corps, as long as I was Chief. That was nice.

So we took all our books and went home.

Tennessee-Tombigbee was ultimately finished and I went to the dedication. Don Walden, the Tennessee-Tombigbee Waterway Association manager, had been very active through all of these years of political pressure and development. It was quite a celebration. I was happy to see that the court performance was recognized and that the Corps was given a reasonable amount of credit for the whole thing.

The Tennessee-Tombigbee will always be considered a real test. Interestingly enough, I think the Corps has become more successful in dealing with the environment and the opposition because of the Tennessee-Tombigbee. I don't mean to say that everybody got the idea the Corps was doing right, but it was such a **bitter**—really bitter—debate, that when we came out of that one in good shape, I think it made it easier for subsequent cases or situations to be resolved.

Q: What other projects **occupied** your attention as Chief?

A: I should talk briefly about the Bonneville project because it brings up another issue. The Bonneville project, originally built back in the 1930s or **1940s**, was one of the make-work projects under the Roosevelt Administration, as I recall. The very small town of Bonneville grew up primarily because of the construction people. There were some natives there also. In the course of the years that followed, this little community of Bonneville had grown into a small, medium to lower-middle-class town. It was not a booming or even noticeably prosperous city.

When the new power plant was approved for Bonneville, that little village had to be moved. Getting it moved and then rebuilt turned out to be an issue of national significance.

Jack **Gilkey** was the district engineer there and did a tremendous job in keeping all the warring factions at the conference table. The people of Bonneville, the new Bonneville, really did extract out of the federal government a high price for moving to the new village. All the public facilities for a new town and the infrastructure were government responsibility.

Relocating towns was not a new thing. As I go back to my district days, quite a few towns were relocated. Most of the time the community cooperated. There was always a certain anguish because people had to leave their homes. They were done with minimum turbulence, but not Bonneville. Bonneville was a political game, and the Corps was the football; however, it's done now.

There were other big projects that I can speak of. We should talk a little bit about the problems of the lower Mississippi, which were not so much structural as they were environmental. The old river diversion structure kept the Mississippi River in the Mississippi River channel and precluded the river from going into the Atchafalaya. During the flood of 1974, the structure began to shake, rattle, and roll from great pressure and stress. The decision was taken to relieve it with a new structure. The Atchafalaya is certainly among the one or two most sensitive environmental areas in this country. The law on regulating the Mississippi River established a minimum flow into the Atchafalaya at all times to keep the Atchafalaya channel alive and also to provide water for the surrounding area, not people.

The Corps has come up with several plans to keep the Atchafalaya from filling up with sediment. Every one of those plans runs into a great deal of environmental difficulty. I'm not entirely sure what the present situation is; however, it did seem to me that the worst situation was to do nothing. If you left it alone, it was going to get in trouble, so therefore, the problem was, "What could you do?"

Everything that was attempted became an environmental tug-of-war. We never really solved the Atchafalaya problem during my time.

New **Melones** was another new project in the West. During the period of time in June 1979 when it was being filled, and prior to the dedication, the 14th of July 1979, an individual chained himself in the reservoir to a rock and said he was going to stay there and drown if necessary. He didn't. New **Melones** was certainly one of the last of the big projects to be completed and dedicated.

I think that's about enough. If there are specific questions on projects—there are just so many conflicts, so many environmental problems: the lower Chesapeake Bay, the James River, trouble on the Great Lakes because of the winds, et cetera.

**Q:** What about Indian Bend Wash?

**A:** Oh, Indian Bend Wash. I mentioned that earlier. Indian Bend Wash is a successful nonstructural solution in Scottsdale, Arizona. The city had help from Congressman [John Jacob] Rhodes, who was on the House of Representatives Appropriations Committee. I'd known him when I testified from the Missouri River Division. Rhodes was from Kansas originally.

Anyhow, we came up with a scheme that we would build in the floodway through Scottsdale some public facilities—recreation, golf, and other **items**—which if inundated would recover quickly. There were limited regulatory structures in there: some embankment protection and some channelization, but very minor. The entire area was landscaped. So when you go there, you may not know you're in a flood plain.

That, to me, was a landmark case because the Corps had used a nonstructural approach and produced a very fine example of how you could solve flood problems without building a dam.

**Q:** Should we touch briefly here on the urban studies program?

A: This was covered in detail earlier in our interview, but I will recount it briefly. You will recall, it grew out of a requirement by Senator Hruska of Nebraska when I was in Omaha. His new idea was to have all water-related federal money coming into the region through the Corps for management. My reaction was that that would be too controversial and that we'd be better off appointing the Corps as the coordinating agency of a committee made up of local people and the other agencies to develop a plan.

That first urban study turned out to be very helpful and attractive. Other cities requested help, and that effort developed into a program as discussed earlier. I don't know how many of these studies we did. I think we must have done 30 or so. It was a good engineering program which lasted over six years. There's no reason why those urban studies aren't of continued value.

My thought was then, and still is, a vision that if those studies were properly done and could be integrated into a software program in some fashion, then the city manager could very easily determine his budgets, his future priorities for investments, and on this integrated plan, make sure that the federal funds available are put to the most productive use and in the right sequence.

Q: Did it continue after you were Chief?

A: I think we had some studies going on. I'd have to go back and check. The districts took about three years to do one, as I recall.

Q: I might toss in one other topic here, for maybe just a couple of minutes. We've been talking about dredging. Was the disposal of dredged material a controversial issue while you were Chief?

A: It always was, and yes. We covered this matter in some detail in the director of Civil Works period; however, it did continue through the 1976 to 1980 period. The study envisioned by Frank Koisch and commissioned by the Congress [in 1971 or 1972] to evaluate dredge material was still active and is going on, as far as I know. By the end of my term as Chief, we had learned that dredge material is not as bad as claimed. In the meantime, dredge "spoil" was guilty until we could prove otherwise, and much dredging was stopped.

As mentioned before, the problem was really worldwide. That circumstance led to the international dredging conference in London where the Corps played a big role. Out of that came certain international standards on dredging.

As a sidelight, we had to change our hopper-dredging procedures. For years we let the hopper overflow to get rid of excess water allowing the hoppers to contain more material. Well, the overflowing was stopped to reduce or avoid pollution. That meant we made a lot more trips to sea than before, and that meant we didn't get as much dredging done as we used to for the same cost.

You will recall that because of these experiences, I wrote a letter while Chief to Mr. Roger Peterson, president of the Audubon Society, and proposed that if he would give us the criteria, I thought we could build wetlands and habitat for endangered species, or whatever. I'm still convinced the Corps can be helpful in this regard.

As you can guess, we undertook quite an aggressive program to put the best light on the dredge material situation. After all, a great factor in the U.S. economic picture was the operation of ports, harbors, and waterways.

**Q:** In addition to standard divisions and labs, what other Corps organizations reported to the Chief?

**A:** There are three of them: the Board of Engineers for Rivers and Harbors, the Engineer Studies Center, and the educational facility at Huntsville. The Board of Engineers for Rivers and Harbors was established by Congress with the idea of providing an independent review capability at the highest level to look at projects for the Chief of Engineers before they were recommended to the Congress.

That board, in my judgment, worked directly for the Chief of Engineers, not for the director of Civil Works. In fact, the director of Civil Works is the one element that the Board of Engineers for Rivers and Harbors should not have worked for, because the board's mission was to review projects after they had passed through the staff system and were ready for the Chief's final review.

The point is that the board was there to provide the Chief of Engineers an independent review of these projects. I'm not talking only about the board, which is comprised of division engineers. I'm talking about the staff as well. The permanent staff of the Board of Engineers for Rivers and Harbors was composed of truly outstanding people-some of the best minds we had. People came from our districts to serve. The board conducted a training program for selected district personnel called the Planning Associates Program.

If a project cleared the Board of Engineers for Rivers and Harbors, the Chief then could sign off and send it on its way with a high level of comfort that it was technically adequate, did not violate policies or laws, and deserved whatever was recommended.



*Meg Sergeant, wife of Colonel Howard Sergeant, painted this portrait of General Morris when he was Chief of Engineers.*

I sincerely believe that the Board of Engineers for Rivers and Harbors was a most valuable institution in protecting the taxpayers. Why it was abolished is not clear. I'm sure it was an economy move, and somebody thought it was just a review board and probably we could get along without it. We're not going to get along without it. We're going to pay a very serious price for not having it, either in poor projects getting through or in hiring somebody else to do what they were doing in the first place.

I notice now we're turning to the National Academy of Engineering to provide its input on Corps projects. If the Board of Engineers for Rivers and Harbors existed, such might not have been needed.

I considered it a high honor to be chairman of the Board of Engineers for Rivers and Harbors. I tried always to reflect my high regard for the board and staff and the importance of their job.