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DARHT - AN 'ADEQUATE' EIS: A NEPA CASE STUDY

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In April 1996 the U.S. District Court in Albuquerque ruled that the Dual Axis Radiographic Hydrodynamic Test (DARHT) Facility Environmental Impact Statement (EIS), prepared by the Los Alamos Area Office, U.S. Department of Energy (DOE), was "adequate." The DARHT EIS had been prepared in the face of a lawsuit in only 10 months, a third of the time usually allotted for a DOE EIS, and for only a small fraction of the cost of a typical DOE EIS. Its subject was the first major facility to be built in decades for the DOE nuclear weapons stockpile stewardship program. It was the first EIS to be prepared for a proposal at DOE's Los Alamos National Laboratory since 1979, and the first ever prepared by the Los Alamos Area Office. Much of the subject matter was classified. The facility had been specially designed to minimize impacts to a nearby prehistoric Native American ruin, and extensive consultation with American Indian Pueblos was required. The week that the draft EIS was published Laboratory biologists identified a previously unknown pair of Mexican spotted owls in the immediate vicinity of the project, bringing into play the consultation requirements of the Endangered Species Act. In spite of these obstacles, the resultant DARHT EIS was reviewed by the court and found to meet all statutory and regulatory requirements; the court praised the treatment of the classified material which served as a basis for the environmental analysis.

Construction of the DARHT facility began in May 1994 after over 10 years of study and design. Environmental reviews were prepared and revised as the project scope evolved. In November 1994, as the walls of the facility were taking shape, DOE published its Notice of Intent to prepare an EIS just as suit was filed by two citizen organizations. In January 1995 the construction project was halted by Court injunction. The draft EIS was published in May, and the final EIS in August. A Record of Decision (ROD) was issued on October 10, 1995. Among other things, the ROD mandated preparation of a Laboratory-wide Threatened and Endangered Species Habitat Management Plan. The final decision incorporated several mitigation measures developed through the EIS process.

The lessons to be learned from the DARHT EIS are several. Incremental changes to an evolving project design resulted in the environmental impacts crossing a threshold of significance. The attempt to mitigate one set of impacts (cultural resources) through design considerations was offset by impacts to another resource (threatened and endangered species). The EIS was effective in that DOE changed its preferred course of action to incorporate many more environmental protection measures than originally envisioned. DOE decided to implement a first-ever Laboratory-wide habitat management plan in order to avoid the risk to future projects from project-scale field reviews. Most important, the EIS demonstrated that, through teamwork, a quality analysis could be prepared in a short timeframe for a politically-sensitive, technically-sophisticated, largely-classified subject.

The author was the project manager in charge of preparing the DARHT EIS for the DOE.

INTRODUCTION

The Dual Axis Radiographic Hydrodynamic Test (DARHT) Facility Environmental Impact Statement (EIS) provides a case study that is interesting for many reasons. The EIS was prepared quickly, in the face of a lawsuit, for a project with unforeseen environmental impacts, for a facility that was deemed urgently essential to national security. Following judicial review the DARHT EIS was deemed to be "adequate."

DARHT is a facility now being built at Los Alamos National Laboratory (LANL) as part of the Department of Energy (DOE) nuclear weapons stockpile stewardship program. DARHT will be used to evaluate the safety and reliability of nuclear weapons, evaluate conventional munitions and study high-velocity impact phenomena. DARHT will be equipped with two accelerator-driven, high-intensity X-ray machines to record images of materials driven by high explosives. DARHT will be used for a variety of hydrodynamic tests, and DOE plans to conduct some dynamic experiments using plutonium at DARHT as well.

THE DARHT DILEMMA

In May 1994, DOE and LANL officials participated in a sparsely-attended ground-breaking ceremony in a remote part of the Laboratory's extensive property in northern New Mexico. The event initiated the construction of a new LANL building, to be called the DARHT Facility, planned to upgrade and replace an older test facility which had been in use since the 1960's. A picture or two of the ground-breaking, showing men in suits and hard hats digging small shovelfuls of dirt, appeared in the local newspaper but was given little press interest elsewhere.

Over the course of the summer, foundations for the new building were dug, a large earthen berm was built, and concrete trucks began to roll into the construction site. Two large accelerator halls began to take shape, forming a symmetrical "L" -- two long thin buildings at right angles to each other, each with windowless concrete walls 225 feet long, each about 50 feet wide, each reaching three to five stories above the construction grade. The engineering work for the accelerators was underway, and paperwork for the purchase of the first long-lead accelerator components was being prepared. The construction project was proceeding on schedule, within the expected budget, with no major delays anticipated.

However, the DARHT project had not gone totally unnoticed. Two citizen interest groups from Santa Fe made inquiry of the local DOE office regarding this project. What was the purpose of the new facility? How much was budgeted? What environmental reviews had been completed? The local office answered the questions: the facility was to provide an enhanced hydrodynamic testing capability to assist with stewardship of nuclear weapons; Congress had approved a line item of about $120 million; the facility had undergone a

succession of small-scale environmental reviews in the 1980's which indicated that the expected impacts would be "insignificant."

In October 1994, the citizen groups wrote to the Secretary of Energy stating that the DARHT project should be halted. The groups alleged that no adequate NEPA review had been completed and that an Environmental Impact Statement (EIS) was needed. In addition, the groups charged, DOE could not complete an EIS for the new DARHT facility until two other NEPA reviews were completed: the recently-begun Stockpile Stewardship and Management (SS&M) Programmatic Environmental Impact Statement (PEIS); and a LANL Sitewide Environmental Impact Statement (SWEIS). In 1991, DOE had begun its Reconfiguration PEIS to address the future of its nuclear weapons complex, but that future had changed significantly in the wake of new Presidential policies, a recently-announced continuation of a moratorium on nuclear testing, and renewed interest in passage of a Comprehensive Test Ban Treaty. Accordingly, on October 28, 1994, DOE issued a Notice of its plans to prepare a PEIS on its redefined SS&M program [59 FR 54175]. The SWEIS already had started -- in August 1994 DOE had published in the *Federal Register* an Advance Notice of Intent (NOI) to prepare a new SWEIS to replace the aging 1979 SWEIS [59 FR 40889].

After reviewing the letter to the Secretary, DOE and LANL personnel met in early November 1994 to consider the DARHT dilemma. There were essentially three possible courses of action: prepare an EIS, prepare a lesser review called an Environmental Assessment (EA), or do nothing. Construction of the DARHT facility was of high national priority, even more so in the light of the underground testing moratorium and a new reliance on a science-based approach to monitoring and maintaining the nuclear weapons stockpile. DOE's track record of time and expense for completing EISs was not favorable -- in the event that DOE prepared an EIS, it could take several years and several millions of dollars to complete, even if a support services contractor could be procured quickly. Further, no EIS has been prepared for any action at LANL since 1979. If DOE could assume that the project would not result in significant environmental impacts, an EA could possibly be conducted in less time than an EIS; however, to avoid having to prepare an EIS also, the EA would have to support a Finding of No Significant Impact (FONSI). It was not clear that the environmental analysis of a project the size of DARHT would result in a FONSI. Even if such a finding could be reached the adequacy of any EA and FONSI would be subject to court challenge. DARHT construction had begun based on the several environmental reviews conducted over the prior 12 years. If DOE did not prepare any additional NEPA documentation, it would have to successfully defend its prior review record; that path risked taking substantially more time if DOE did not prevail and the Court subsequently ordered DOE to prepare an EIS.

After considering the options DOE decided to prepare an EIS on the partially-completed facility, and to complete the DARHT EIS within a remarkable schedule of less than a year. This schedule would be possible only if there were no missteps or delays. A Document Manager was assigned from the DOE Los Alamos Area Office (DOE/LAAO); the Document Manager drafted a NOI to initiate a DARHT EIS and started it through the cumbersome DOE review and concurrence chain.

On November 16, 1994, two citizen groups, the Los Alamos Study Group and Concerned Citizens for Nuclear Safety, filed a lawsuit in U.S. District Court, Albuquerque, New Mexico, to enjoin DOE from proceeding with the DARHT project

until completion of an EIS and issuance of a Record of Decision (ROD). On November 22, four working days later, DOE's NOI to prepare the DARHT EIS was published [59 FR 60134].

ACCOMPLISHING THE DARHT EIS

Once that DOE decided that it would be faster to go ahead with preparing an EIS than arguing about the merits of such a course of action, it had to proceed quickly. DOE decided to use an existing contracting vehicle, and to make greater use of the local DOE office and site personnel.

Organization

DOE appointed a Document Manager (the author) from DOE/LAAO to oversee the preparation of the DARHT EIS, with oversight from the DOE Albuquerque Operations Office (DOE/AL, the organizational parent office of DOE/LAAO) and DOE Headquarters in Washington, D.C. Although the Document Manager had previous EIS experience, DOE/LAAO had never been involved in preparing an EIS. DOE/AL tasked an existing support services contractor, Battelle Memorial Institute (through its Albuquerque office), to assist with preparation of the EIS. Battelle also is the operating contractor for DOE's Pacific Northwest Laboratories (PNL) in Richland, Washington, so PNL could assist with the EIS.

The Document Manager formed an EIS team consisting of LANL personnel who had worked on the DARHT project or were familiar with the site; Battelle; PNL; and DOE. DOE prepared policy information, such as the purpose and need for the proposed action, definition of alternatives that would be analyzed, and information regarding nonproliferation and other national issues. The Laboratory personnel were assigned responsibility for compiling factual information regarding the proposed action, alternative courses of action, and the site environmental baseline. PNL provided environmental impact analyses. Battelle provided document integration and overall assistance.

Initially there was a trust issue to be overcome. The people seated around the table at the first EIS team meeting did not know each other. Few of them had any EIS experience. However, due in part to the accelerated timeframe and intensity of the project, the members of the team quickly learned to work together and to respect one another.

Timing

Time was of the essence in preparing the DARHT EIS. From the point in November 1994 when it decided to go forward with the DARHT EIS, DOE realized that there could be no time lost to indecision or extended timeframes. Some concessions had to be made for the holiday season, and DOE and Battelle could not get an agreement in place before early January. DOE established a 50-day scoping period, starting with the NOI on November 22, 1994, and ending slightly after the first of the year on January 10, 1995.

DOE went ahead with scoping meetings prior to having a support services contractor on board, and public scoping meetings were held in Los Alamos and Santa Fe in December two weeks after the NOI. Public meetings regarding LANL are often contentious. To avoid confrontation DOE used a new workshop format, which was well-received in both locations. The meetings were divided into

three parts: an information room, with poster sessions and staff for off-the-record discussions; a "quiet room" where people could write or record comments privately; and an on-the-record roundtable discussion, where people could make statements or ask questions of DOE or senior Laboratory officials.

In addition to public meetings, DOE and LANL met with tribal and local governments. DOE and LANL have signed agreements with four neighboring American Indian Pueblos -- Cochiti, Jemez, Santa Clara, and San Ildefonso -- which assure that these four tribes will be involved in Laboratory planning and environmental reviews. There are several archaeological sites of interest to these tribes in the vicinity of DARHT, so DOE and the Laboratory hosted tribal officials for a site visit. DOE also made a presentation to the Los Alamos County Council to discuss the project with the local government.

Preparing the EIS

Shortly after the end of the scoping period, on January 27, 1995, the U.S. District Court enjoined further work on DARHT until completion of an "adequate" EIS and ROD. The site was put in a safe standby condition; the standby cost to maintain the DARHT contracts and the construction site would be about $1 million per month. The injunction and the standby costs put additional pressure on the team to complete the DARHT EIS as quickly as possible: regardless of whether the decision would be to go ahead with the construction or to abandon the project, the sooner the EIS was completed and a ROD signed, the sooner the standby cost could be discontinued.

In order to save time the EIS was prepared using a concurrent rather than sequential process. As soon as the document was compiled in draft form all reviewers met in a week-long concurrent review session. That way issues could be worked out real-time and reviewers were at the same table with the people who had prepared analyses or compiled baseline information. Ground rules were developed and followed, such as "better is the enemy of good enough." Side meetings were held on specific items of interest, such as biological resources. For the Draft EIS, review of the entire 400 page draft document took place in one week.

A similar approach was used for the Final EIS. The primary ground rule was that the text of the published Draft EIS would hold unless there was a reason to change it. Reasons included such things as a change in circumstances, additional Presidential statements, requests for clarification from the public review process, or a refinement of the analysis. On the other hand, the preparers were quick to expand, change, or clarify text if public comments indicated a misunderstanding or oversight.

A decision was made early on to prepare a classified supplement for the EIS. Many aspects of the nuclear weapons stockpile stewardship program and the hydrodynamic testing program are classified. As such, this information must of necessity be shielded from public review. Although public scrutiny of the Federal decision making process is an inherent part of NEPA, the Council on Environmental Quality (CEQ) and DOE regulations provide for the preparation of classified NEPA documents where required. The benefit of considering environmental impacts, even when in a classified venue, was considered to be more important than the detriment of withholding analysis information from the public during the review process. The classified supplement for the DARHT

- Draft and Final EIS provided additional information and analysis pertaining to the proposal for the DOE decisionmakers.

Public Review

DOE took a new approach in soliciting public comments on the Draft EIS. During the public review period, DOE and LANL hosted several tours of the DARHT construction site for State, tribal, local government, and Federal officials and others. In addition, DOE took the unusual step of allowing appropriately-cleared reviewers review the classified supplement to the EIS.

DOE requires that at least one public hearing be held on any draft EIS. The format for a DOE public hearing usually consisted of a briefing from the hearing official, then a series of timeslots for members of the public to give comments, recorded by a court reporter. The public hearings for the DARHT EIS were conducted using the same three-tiered approach as the scoping meetings. The format proved to be successful -- one of the litigating parties praised the format as the preferred approach for all future DOE public meetings.

DOE provided a review of the draft classified supplement for appropriately cleared parties with a need to know the classified material: the Department of Defense, the Environmental Protection Agency (EPA), the State of New Mexico, and certain tribal governments. Like the unclassified portion of the EIS, the final classified supplement reflected changes due to the external review. In part based upon its review of the classified supplement, the EPA classified the DARHT EIS as "LO;" that is, "Lack of Objections."

ANALYSIS ISSUES

Three main environmental analysis issues surfaced during the course of preparing the DARHT EIS: archaeological sites and consideration of traditional cultural values; the presence of a Federally-listed threatened species, the Mexican spotted owl; and the accident analysis.

Cultural

The general vicinity of the DARHT site is an area rich in prehistoric ruins. This area was the ancestral home of several present-day American Indian Pueblos. A large ruin, Nake'muu, stands across a narrow canyon from the DARHT facility. Other less-significant cultural resources sites are in the general vicinity of the facility. The access road route was redesigned to go around a ruin. The beam-stop berm was constructed over another ruin. The initial approach was to excavate this site to extract the data; however, after consultation with San Ildefonso Pueblo, and at their request, the site was banked and buried intact under the berm. During the last stages of design the footprint of the entire DARHT building was rotated to protect the Nake'muu ruin from the possibility of flying shrapnel by placing it in the blast shadow of the facility.

To ensure that cultural resources in the vicinity were adequately protected, the tribal elders of the four nearby Pueblos were offered tours of the site, even though the site is in an area where access is generally restricted to individuals holding a high-level security clearance. To protect privacy, a separate tour was held for each Pueblo. DOE agreed to hold periodic tours for

tribal officials as long as the site was in use, regardless of whether construction of DARHT resumed.

Biological

Initial field surveys of the DARHT site conducted in the mid-1980's did not indicate that any Federally protected threatened or endangered species were present. However, the Mexican spotted owl was added to the list of threatened species in November 1994 at about the time that the DARHT EIS was initiated. Just as the Draft EIS was being printed in May 1995, LANL biologists conducted their first-ever field survey for the Mexican spotted owl and identified suitable habitat in the vicinity of the DARHT site. The week that the Draft EIS was distributed, the biologists documented field observations of two spotted owls, and in the following two months confirmed that the pair had nested and successfully fledged two owlets. This was the only confirmed breeding pair found in the Jemez Mountains that summer. Ironically, by rotating the DARHT building to protect Nake'muu, the building was now angled so that the spotted owl habitat would be at somewhat greater risk if DARHT were operated.

DOE, LANL and U.S. Fish and Wildlife Service entered into consultation. Because information regarding the extent and range of spotted owl habitat within the Laboratory was so scanty, an agreement was reached that, regardless of the outcome of the decision as to whether or not to continue with the construction of DARHT, DOE and LANL would undertake a Laboratory-wide study of all threatened and endangered species. The purpose of this mitigation was to develop a comprehensive habitat management plan instead of relying on the piecemeal studies that had been done in the past. This would better protect the Laboratory's ability to carry out its mission in conformance with the provisions of the Endangered Species Act. The Threatened and Endangered Species Habitat Management Plan, now midway through its second full year, is expected to serve as a model for state-of-the-art analysis and integration of environmental protection requirements and ongoing mission and facility operation needs.

Accident Analysis

As with all DOE EISs, the DARHT EIS analyzed the potential for adverse impacts to workers and the general public under routine and accident conditions. After the DARHT Draft EIS was issued, and as part of its ongoing declassification efforts and normal classification reviews, DOE determined that most of the environmental impacts identified and discussed in the classified supplement were not classified although they depend on classified information. DOE issued an unclassified summary of the environmental impacts from the classified supplement shortly after release of the Draft EIS, and subsequently included this discussion in the Final EIS. This information discussed the potential for adverse impacts to workers and the public under routine or accident conditions during dynamic experiments with plutonium. By including the information in the Final EIS DOE was better able to describe the cumulative impact of operating DARHT facility, even under accident conditions.

COURT REVIEW

From the first, it was known that the final test of the DARHT EIS would be the judicial review by the U.S. District Court. On April 16, 1996, the Court found that "notwithstanding the haste with which the DARHT FEIS was produced, and notwithstanding its release prior to a final Los Alamos SWEIS and national SS&M PEIS, the DARHT FEIS adequately serves the purposes of NEPA." The Court noted that the EIS disclosed that the construction and operation of DARHT would entail some environmental damage for certain, and the risk of greater environmental damage would be substantial, but that the DARHT EIS identified and analyzed these impacts sufficiently to allow DOE to "knowingly" decide to take that course of action.

A key issue in the DARHT EIS lawsuit was the question of whether or not DARHT could proceed as an "interim action" within the meaning of 40 CFR 1506.1. Briefly, the CEQ regulations state that while work on a required programmatic EIS is in progress, an agency may not take in the interim any major Federal action which is a part of the program unless the action: 1) is justified independently; 2) is covered by an adequate EIS; and 3) would not prejudice the ultimate decision on the program. Litigants contended that the DARHT project needed to wait until completion of both the SS&M PEIS and the SWEIS, and argued that DARHT did not meet the three-part test for an interim action.

The Court reviewed the DARHT project to see if it stood up against the interim action test while the SS&M PEIS and the SWEIS were underway. The court found that the three-part test was met, and that DARHT could proceed as an interim action. The second condition of the interim action test was met by the Court's finding that the DARHT EIS was "adequate." The Court found that the third condition was met because it was the underlying intellectual and technological infrastructure already at place at LANL, not the presence of the proposed DARHT facility, that made the Laboratory a reasonable location for the activities analyzed in the SS&M PEIS. The SWEIS would address the composite legacy of activities at LANL, and similarly would not be prejudiced by the decision whether or not to operate DARHT.

The Court took a closer look at the first part of the interim action test, independent justification of the DARHT project. DOE argued that urgent national policy considerations independently justified DARHT. However, the Court felt that this was not an appropriate argument, "given the mandate of NEPA to act procedurally rather than substantively." The Court instead looked at whether the DARHT project would have utility regardless of programmatic options. "Thus, the third requirement asks whether the project will unduly influence programmatic decisions and the first asks whether the project will be meaningful notwithstanding the range of prospective programmatic choices." The Court found this to be the case: the hydrodynamic testing program that would be carried out at DARHT would be required regardless of the outcome of the alternatives considered in the SS&M PEIS.

PRIOR REVIEWS OF DARHT

The DARHT environmental review history demonstrates how seemingly small incremental changes in project design over a period of twelve years can lead to a very different project than that originally envisioned. The DARHT facility under construction in 1994 bore very little resemblance to the

project initially designed in 1982, although it responded to the same underlying need for a better diagnostic machine. Each incremental design change evolved from the prior iteration, and each made the potential performance of the new facility "better." Because each step seemed similar, the environmental impacts of each step were dismissed as similar to those analyzed before rather than comparing back to the environmental baseline.

Plaintiffs charged that no NEPA review had been done for DARHT, but DOE and the Laboratory had prepared and revised several environmental reviews for the facility over the preceding fifteen years. This series of comparative reviews addressed the incremental design changes of the facility, but did not look at the impacts of the total project. The record was complicated by the fact that during this same period, DOE changed how it prepared NEPA reviews and its attitudes about listening to public concerns.

Changes in the DOE NEPA Process

DOE made several substantial changes to its NEPA review process during the period of time that DARHT was being designed. The DOE NEPA review standard at the end of the DARHT design process in 1994 was not the same as the standard at the beginning of the process in 1982.

Following promulgation of the CEQ NEPA regulations in 1978 [40 CFR 1500], DOE published its NEPA Guidelines in the *Federal Register* in 1980 [52 FR 47662]. Because the then-new agency had very little experience upon which to base categorical exclusion determinations, DOE guidance provided that when it was clear that a proposal would not significantly affect the environment a memorandum could be written to the file documenting this determination. This came to be known as a "Memorandum to File" or "MTF." DOE often prepared a memorandum describing the proposed action and its expected impacts, called an "Action Description Memorandum" or "ADM." The list of categorical exclusions in the 1980 guidelines included "actions that are substantially the same as other actions for which the environmental effects have already been assessed in a NEPA document and determined by DOE to be clearly insignificant and where such assessment is currently valid."

In February 1989, the Secretary of Energy issued a directive regarding revisions to the NEPA process. Among other things, the directive rescinded the categorical exclusion regarding similar actions because it was felt that it had been misunderstood and misused; asked that the use of MTFs be reexamined; and directed DOE to promulgate its prior NEPA review guidelines as a formal rule. DOE Headquarters asked its field offices to identify what recent projects had been reviewed using an MTF, and whether or not an EA should have been written instead. DOE subsequently discontinued use of the MTF/ADM as a NEPA review vehicle. In April 1992, the DOE NEPA regulations were promulgated [10 CFR 1021].

During this same timeframe, DOE reassessed its relationship with the general public. Where the unwritten rule of thumb in the past seemed to have been to minimize information, in the 1990's DOE seemed to bend over backwards to inundate the public with information and to prepare more NEPA documents than ever before.

Fifteen Years of Environmental Reviews

DOE had prepared several environmental reviews of DARHT in the 1980's using its older NEPA guidance. The ongoing hydrodynamic testing program at Los Alamos, DARHT, and DARHT's conceptual predecessors were subject to the following environmental reviews.

The original *Los Alamos National Laboratory Site-Wide EIS* mentioned the hydrodynamic testing program as part of the Laboratory's ongoing firing site operations. The EIS was published in December 1979 and the ROD in April 1981.

An ADM was prepared in August 1982 for the initial concept of DARHT: a new small flash x-ray machine to be installed near an existing flash x-ray machine. A companion MTF was completed in May 1983. DOE concluded that the environmental impacts from the project were clearly insignificant.

In 1984 the project was redesigned to provide for a stand-alone firing site facility with two new x-ray machines instead of one. One machine was to be fixed, and the other mounted on a moveable carriage on a track. A revised ADM was completed in February 1984 and an MTF in June 1984. DOE concluded that the impacts of the revised project would be essentially the same as those of the original project.

In 1986 and 1987, the project was again revised to include linear induction technology to power the two x-ray machines. This technology required housing the two accelerators in buildings, and the firing site footprint was enlarged. The ADM was revised in July 1987 and did not identify any new environmental impacts. Based on the revised ADM, in November 1987 DOE filled out a standard form, the "ADM/MTF Checklist," and determined that the revised proposal was substantially the same as the earlier proposal. DOE determined, therefore, that the 1987 revisions to the proposal were categorically excluded from the need to prepare either an EIS or an EA.

In 1989, DOE reviewed all then-recent MTFs to determine if EAs should have been prepared instead. DOE confirmed that the MTF for DARHT was appropriate.

In 1993, DOE decided to fund the accelerator and x-ray equipment for the second axis of DARHT under a separate Congressional budgeting line item. In November 1993 DOE confirmed that the overall project scope had not changed because the prior ADMs and MTFs covered the equipment in both accelerator halls, therefore separating the funding into two line items did not trigger additional NEPA review.

Over the course of twelve years, DOE prepared four revisions to its original environmental review. However, DOE did not take into account whether those revisions provided a reasonable environmental review given the overall magnitude of the changes to the project.

DARHT: AN "ADEQUATE" EIS

The DARHT EIS was prepared with a foreshortened timeline, and with a host of organizational and analysis problems. Beyond that, the DARHT EIS came about as a result of the interweaving of four largely unrelated threads: first, changes in the way a Federal agency, DOE, performed its NEPA reviews; second,

a view of project management which considered only incremental evolutionary steps rather than the whole; third, a change in the way the agency viewed its responsibilities to respond to public inquiry; and fourth, with the end of the Cold War, a fundamental shift in the way the nation would take care of the nuclear weapons it had stockpiled over the decades. Despite these obstacles, the EIS "adequately" served its purpose.

If DOE had continued to operate under its prior philosophy of avoiding NEPA reviews, it is unlikely that the agency would have initiated the DARHT EIS absent a Court order to do so. However, the change in DOE's NEPA requirements opened up scrutiny of the prior reviews under the old "MTF/ADM" system. DOE's newfound willingness to respond openly to public inquiry about its environmental documentation provided a climate favorable to taking a new approach, that is, to embark upon the DARHT EIS. Even if the DOE's NEPA process had not changed, in retrospect it is easy to see that the DARHT project changed substantially during the course of twelve or fifteen years of design. At the time, however, given DOE's philosophy of incremental accretion in project review, it was not evident to the field personnel that there was a need to reconsider the environmental impacts of the entire DARHT project. The standard used for the review was the similarity between steps, not the overall effect of project changes. The importance of the DARHT project also changed during this time. As the nation shifted its philosophy regarding nuclear testing, the need for DARHT's capabilities became much more important. For example, in August 1995 just before the DARHT EIS was finished the President made a major policy statement about the future role of nuclear weapons in relation to the Comprehensive Test Ban Treaty.

The lessons learned from DARHT were largely positive. Because the EIS was prepared under such intense pressure, DOE was willing to focus its attention on getting the job done quickly, which resulted in substantial cost benefits to the agency. The EIS was successful in several other aspects as well.

Because the Mexican spotted owl was discovered near DARHT, DOE, the Laboratory and the U.S. Fish and Wildlife Service were able to enter into an agreement that for the first time, a comprehensive site-wide review would be performed at LANL to identify and preserve that habitat of Federally-listed threatened and endangered species. Without the high visibility of the DARHT project, it is highly likely that a consensus could not have been achieved to pursue anything other than the piecemeal approach of the past. The DARHT EIS was successful in achieving a site-wide mitigation approach that would have benefit far beyond the DARHT project. A comprehensive look at mitigation will help to prevent the situation at DARHT, where the measures taken to mitigate one adverse impact, to an archaeological site, exacerbated the potential for impact to another resource, wildlife habitat.

The public raised concerns about the environmental impacts of the proposal to conduct many tests as open-air explosive shots. There was concern that the spread of shrapnel from these shots would damage archaeological sites, wildlife, vegetation, and would contaminate the soils in the vicinity of the firing site. As a result of agency and public input, DOE revised the alternatives in the Final EIS to include a "phased containment" approach, where the use of large, steel containment vessels would be phased in over a ten-year period. Ultimately, the revised alternative was selected in the ROD. The EIS process and public review and input into the decision was effective in

- that although the facility was partially constructed, DOE changed how the facility would be operated.

In the DARHT EIS review process, DOE changed its approach to public interaction. The public was literally brought to the table, both in the scoping process and the review of the Draft EIS. Several tours of the construction site and vicinity were given to officials and some members of the general public.

DOE relied on a classified supplement. While DOE had prepared classified supplements to other EISs, the classified supplement to the DARHT EIS was an integral part of the document. The Court praised the use of the classified material, and encouraged the use of this format when necessary in order to fully explain the impacts of classified subjects.

The DARHT EIS could not have been prepared in the short timeframe and to the degree of quality required to pass judicial scrutiny without the teamwork among the DOE, the Laboratory, and the EIS contractor. In the long run, it was the interaction of the team that allowed the DARHT EIS to be "adequate."

Timeline

A timeline for the DARHT EIS is as follows.

October 1994. Letter of intent to sue.
November 16, 1994. Lawsuit filed.
November 22, 1994. Notice of Intent published.
December 7 and 8, 1994. Public scoping meetings.
January 10, 1995. End of public scoping period.
January 27, 1995. Preliminary injunction against further construction.
February 3, 1995. Implementation Plan issued.
April, 1995. Concurrent review of draft document.
May 5, 1995. Draft EIS made available for public review and comment.
May 5, 1995. Final injunction.
May, 1995. Mexican spotted owls discovered in vicinity of DARHT site.
May, 1995. Unclassified summary of environmental impacts from classified supplement issued.
May 31 and June 1, 1995. Public Hearings on the draft EIS.
August 11, 1995. Presidential statement on the Comprehensive Test Ban Treaty.
August 25, 1995. Final EIS issued.
October 10, 1995. Record of Decision issued.
January, 1996. Site-wide Threatened and Endangered Species Habitat Management Plan initiated.
January, 1996. Mitigation Action Plan issued.
April 16, 1996. Injunction lifted; U.S. District Court ruled that the DARHT EIS is "adequate."

BACKGROUND INFORMATION

Why is the DOE Responsible for Nuclear Weapons?

DOE administers the energy functions of the Federal government. The nuclear weapons program is one of the recognized DOE energy functions. The origin of the DOE dates to the formation of the U.S. Army's Manhattan Engineer District

in August 1942. More widely known as the Manhattan Project, this organization developed the first research and development laboratory and early production factories that were used to create the two nuclear weapons used in World War II. In 1946 Congress created the Atomic Energy Commission (AEC) to assume the responsibilities of the Manhattan Project; this placed the design and production of nuclear weapons under a five-member civilian commission instead of the military. The *Atomic Energy Act* of 1954 defined the nuclear weapons manufacturing role of the AEC and assigned the sustainment of the nuclear weapons stockpile to the AEC. In 1974 Congress abolished the AEC and transferred part of its functions to the newly-created Energy Research and Development Administration (ERDA). In 1977 Congress created DOE to consolidate major federal energy functions, the responsibilities of ERDA, and several other energy and power-marketing responsibilities.

As the successor to the AEC, today the DOE is responsible for the stewardship and management of the nation's nuclear weapons. DOE conducts surveillance activities to monitor existing nuclear weapons to ensure that the weapons remain safe and reliable throughout the period of time that they are in the nation's nuclear weapons stockpile.

What is the DOE's Nuclear Weapons Complex?

The nuclear weapons complex is a series of DOE sites and facilities across the country which are involved in the design, testing, manufacture, surveillance, upkeep and dismantlement of nuclear weapons. The U.S. no longer produces new-design nuclear weapons, but must manufacture parts for existing weapons and maintain them. The complex started in 1943 with three sites: Los Alamos, New Mexico; Oak Ridge, Tennessee; and Hanford, Washington. After World War II, the nation chose to keep this investment in national defense and to build and strengthen the nation's ability to design and manufacture nuclear weapons. At the height of the Cold War, about two dozen sites across the country and in the Pacific were involved in the design, development, testing, production and surveillance of nuclear weapons. AEC developed a system of Federal field sites which oversaw operations at several government-owned, contractor-operated, laboratories and factories. Major changes in national policy in the mid-1960's, the late 1980's, and the 1990's resulted in downsizing and closing several facilities. This in turn has resulted in restructuring DOE field organizations and changing missions at several sites. The nuclear weapons complex now consists of three laboratories, one test site, and four industrial plant sites.

What is Los Alamos National Laboratory?

LANL is a DOE research and technology development laboratory operated under contract by the University of California. LANL is one of the largest research laboratories in the world with an annual budget of about $1 billion and a workforce of about 6,800 people. It is located in north-central New Mexico, about 25 miles from Santa Fe, and covers about 43 square miles of Federal land. Along with Lawrence Livermore National Laboratory in California and Sandia National Laboratories headquartered in Albuquerque, New Mexico, Los Alamos remains one of the three research laboratories in the DOE nuclear weapons complex. Since its start in 1943, LANL's mission has expanded to include research in energy, materials science, computers, biomedicine and other aspects of science research.

What is Hydrodynamic Testing?

Nuclear weapons are among the most technologically sophisticated devices ever developed. DOE is responsible for ensuring that U.S. nuclear weapons remain safe, secure and reliable. This means that DOE must be certain that nuclear weapons will not accidentally detonate, could not be detonated by adverse parties, will not unduly degrade over time from physical or chemical changes, and would perform as intended to produce the nuclear yield intended in the event that the weapons ever had to be used.

As the nation's programs for design and production of nuclear weapons have diminished, the nation's policy for testing nuclear weapons has changed. AEC, ERDA and DOE used a variety of computational and testing methods to ensure that nuclear weapons would behave as expected. In the 1950's, the U.S. tested some of its nuclear weapons in above-ground tests; in the 1960's, the U.S. discontinued atmospheric tests and nuclear tests were conducted underground. The last U.S. underground nuclear test was conducted in 1992; since that time there has been a Presidential moratorium on nuclear testing and DOE has had to rely on other types of tests and analyses.

DOE and its predecessor agencies have used many means, including different types of materials tests, to help ensure the safety and reliability of the nuclear weapons in the stockpile. One technique that has been in use for over fifty years is hydrodynamic testing, which is a specific type of test where high explosives are detonated to create a dynamic reaction in materials and components. The high pressures and temperatures cause some of the materials to behave hydraulically, like a fluid. Historically hydrodynamic tests have been used along with nuclear tests, not as an alternative to nuclear tests. In the absence of nuclear tests, DOE plans to rely more heavily on hydrodynamic testing and dynamic experiments, in particular to study the effects of aging on the materials in a nuclear weapon.

Hydrodynamic tests use specially-built test assemblies that mock the conditions of an actual nuclear weapon. The assemblies are detonated using high explosives. Radiographs (x-ray pictures) are used to obtain information on the resulting movement of material; computer calculations based on these test results are used to predict how an actual nuclear weapon would perform. Dynamic experiments in general are used to gain information on the physical properties and dynamic behavior of materials such as those used in nuclear weapons.

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