THE IMPORTANCE OF DEFINING TECHNICAL ISSUES IN INTERAGENCY ENVIRONMENTAL NEGOTIATIONS

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The role of technical clarity in successful multiparty negotiations was studied. Investigations involved in-depth interviews with the principal participants in six consultations conducted under the U.S. Federal Energy Regulatory Commission's hydroelectric power project licensing procedures. Technical clarity was especially important in these cases because they concerned science-based questions. The principal issues in the six cases were fish passage, instream flow for fish habitat, and entrainment of fish in hydropower turbines. It was concluded that technical clarity was one of the most critical elements in resolving these conflicts. In the least successful negotiations, parties failed to address the basic values of the dispute before plunging into technical studies. The results of those studies usually highlighted the potential for negative outcomes and increased polarization between the participants. In the most successful negotiations, the various parties shared an understanding of each of their basic values. These shared understandings led to technical studies that cast the negotiation in a positive light and illuminated possible solutions.

The way in which a negotiation is framed affects the bargaining strategies of the parties and their willingness to agree (Carnevale & Pruitt, 1992; Mnookin, 1993). Ozawa and Susskind (1985) found that it is common for parties in environmental disputes to disagree on how to study a problem and on how to interpret the results of studies that are conducted. Harter (1982) argued that research in support of negotiation is appropriate when the results may open up a range of alternatives that do not close off avenues for resolution. However, when research is likely to dictate a particular result, parties may not wish to sponsor studies unless they have a good idea what the research will find. On the other hand, when the outcomes of analysis are uncertain, the parties may be willing to participate in joint research efforts (Harter, 1982). Thus, the way in which research needs are described or the results presented can have the effect of framing a negotiation.

The frame of a negotiation is important because it affects the ultimate success of the negotiation (Mnookin, 1993). As Carnevale and Pruitt (1992) put it, "the frame effect in negotiation is a simple matter of the greater significance of loss than of gain" (p. 556). Kahneman and Tversky (1979) and Bazermann, Magliozzi, and Neale (1985) have also shown that when a task is positively framed, parties are more likely to reach agreement than when the task is negatively framed. A positive frame means that negotiators see potential outcomes as gains, whereas a negative frame means that parties see potential outcomes as losses (Carnevale & Pruitt, 1992).

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Those who perceive potential outcomes as losses are less likely to make concessions (Carnevale & Pruitt, 1992; Mnookin, 1993).

The process of making the decision to license a hydroelectric power project presents an excellent opportunity to examine the role of technical studies on the framing of a negotiation. Hydroelectric power projects often include many issues that are amenable to research. Questions such as the necessary level of environmental flows, design of fish passage facilities, recreational uses of the river below the project, and entrainment (i.e., capture) of fish in turbines are frequent subjects of negotiation. All of these issues require site-specific studies to determine the range of potential solutions and the costs and benefits of each solution.

It seems obvious that clearly understood studies and findings are predicates for successful negotiations. For example, Koehler (1995) found that if the negotiating parties possessed technical expertise, that expertise contributed to a successful multiparty environmental negotiation. Langbein and Kerwin (in press) found that participants in negotiated rule-making processes (i.e., where decisions are bargained out by the parties) were far more likely to say that they gained new technical information than were participants in traditional rule-making processes (i.e., where decisions are made by administrative procedure). In reporting his experience in a hydropower dispute, Jung (1995) explained that well-understood technical information promoted trust and a successful resolution. Technical clarity involves understanding the science-based aspects of a project. Science-based aspects include data arising from research (which we label *facts*) and professional judgments (which we label *values*). Portraying scientific studies as containing these two elements is based on the work of Simon (1976), who first described the fact-value dichotomy that is often present in decision making.

Study designs or research results that portray potential outcomes as losses rather than gains may increase a party's resistance to bargaining and reduce the opportunities for success.

The final operating protocols for hydroelectric projects in the United States are developed through negotiations based on findings from a series of studies (Jung, 1995). The design of those studies is derived from the professional values of the parties, and the results are usually communicated to the negotiators as facts by one or more of the parties. Study designs or research results that portray potential outcomes as losses rather than gains may increase a party's resistance to bargaining and reduce the opportunities for success. In this context, *technical clarity* refers to situations where the parties understand the values and facts involved in research and believe that outcomes suggested by study findings will provide potential gains.

Technical values include many issues, such as determining which resources will be influenced by the project. For example, negotiators in hydroelectric power licensing procedures must decide which species of fish and birds and which life stages are important, whether or not to include recreation amenities (for flat and flowing water), and what role cultural resources (such as archeological sites) will play. Another common technical value issue is deciding which baseline will be used to compare against study results and whether studies refer to preproject or postproject conditions. Yet another issue is the geographic extent of project effects, such as how far downstream the effects of altered stream flow should be calculated. Answering the value questions determines what studies should investigate and how large will be the range of effects they consider.

Technical facts, on the other hand, arise from investigations and include findings (such as the effect that level and timing of flow releases have on power production and fish habitat). Other facts that may be developed from studies include (a) the effects of reservoir levels on recreation amenities, (b) profit and loss estimates from different operating scenarios, (c) presence or absence of threatened or endangered species, (d) effects of inundation on cultural amenities, and (e) many other findings.

To determine the relation between technical clarity and successful negotiations, we studied six consultations conducted under the Federal Energy Regulatory Commission's (FERC) hydropower licensing process. Although the procedures for FERC consultation became more formal after passage of the Electric Consumers Protection Act (ECPA) of 1986, the negotiations we studied were typical of environmental conflicts in which the parties were expected to work out acceptable means to protect fisheries and recreation values without the benefit of explicit rules to guide the process or evaluate the solution they reached.

The consultation procedures for all the cases we studied required the applicant for a license to consult with state and federal fish and wildlife agencies and to report the results of those consultations to the FERC. The FERC issued licenses for the projects with terms and conditions that usually reflected the results of the consultation (Kerwin, 1990). The principal environmental issues in the six cases were (a) fish passage, (b) instream flow releases (i.e., the amount of water released to the stream from a powerhouse) for fish habitat, and (c) entrainment of fish in hydropower turbines.

These issues are very common in FERC hydropower licensing consultations because hydroelectric projects often involve (a) damming a stream, (b) bypassing a section of stream (i.e., the "bypassed reach") through a penstock (pipes that transfer water from dam to powerhouse), and (c) dropping the water back into the stream through a turbine that generates electrical power. The flow in a bypassed reach of stream could be significantly reduced when water is routed through the penstock to the powerhouse. In some projects, the turbines are incorporated into the dam itself (resulting in no bypassed reach); in others, the bypassed reach can extend for several miles. In addition, when water is directed through the turbines, flow is increased below the powerhouse. This fluctuation in flow in the bypassed reach and below the powerhouse can be dramatic, causing damage to the fishery and altering the bed and banks of the stream. Finally, fish that pass through the turbines can be injured or killed.

By examining six hydroelectric project decisions, we tried to answer the question, Is technical clarity related to successful negotiation?

How to construct and operate a project so that these effects are minimized is the question at the heart of most FERC hydroelectric license consultations. For example, from 1980 through March of 1983, 59% of hydropower licenses contained special articles governing instream flows (Kerwin, 1990). Instream flow conditions were included in 80% of the licenses issued during 1985 (Kerwin & Robinson, 1985). Answering the question of how to minimize environmental damage is a technical problem amenable to scientific analysis. Although scientists can analyze the problem, the best course of action is not beyond dispute. As Patterson observed about management of California's Central Valley Project: "This will not be just a technical decision. Any program has to be workable politically" (quoted in Burby, 1994, p. 44). By examining six hydroelectric project decisions, we tried to answer the question, Is technical clarity related to successful negotiation?

Methods

We obtained records of 26 hydroelectric power-licensing negotiations from field offices of the U.S. Fish and Wildlife Service (FWS). We asked the field office supervisors to select cases they believed to have been successfully resolved. Representatives from these offices were participants in each negotiation and were required to maintain a record of the consultations. We followed a most similar system research design (Przeworski & Teune, 1970) by selecting the six most similar negotiations for which documentation was available. A similar method for selecting cases to study bargaining has been reported by Langbein and Kerwin (2000). The cases we chose included one new license and five relicense consultations that were negotiated between 1979 and 1992 (FERC consultations are typically lengthy; those we studied ranged from 5 to 13 years and averaged 9 years in duration). The new license case was chosen because of its strong similarity to other cases in terms of applicable licensing regulations (Lamb, 1992) and similar parties and issues. The five relicense cases represent approximately 25% of all FERC relicenses granted to utilities during the period from 1984 to 1989 (Richard Hunt Associates, 1991). All of the cases (a) involved at least the utility applicant, FWS, and the state fish and game agency; (b) were conducted under the same regulatory regime (Bearzi, 1991; Bearzi & Wilkerson, 1990; Kerwin, 1990); and (c) at a minimum dealt with the environmental issues of stream flow, fish passage, and fish entrainment. According to Richard Hunt Associates (1991), these environmental concerns were the most common and time-consuming issues faced by parties to FERC licensing consultations during the period from 1984 to 1989.

We audiotaped structured interviews in 1992 and 1993 with 48 key individuals who had participated in the negotiations. Data were always collected from representatives of the major par-

Table 1: Interview Questions Used to Measure the Clarity of Technical Issues

Prelicense phase of consultation

1. At this phase, did the parties involved agree to the definition of the problem? For example: the geographic extent, range of flows to be considered, important species and life stages, or recreation and other water uses to be included.
2. Did *you* agree with the definition of these problems? If not, then when? [Identify phase]
3. At what point were the studies clearly defined?
4. Once established, was that understanding ever lost? Did it fluctuate or remain constant?
5. For this phase, please rate the technical issues on a scale where 1 = *completely obscure* to 10 = *completely clear.*

Postlicense phase

6. Did technical issues change during this phase? If yes: Were new technical issues introduced or did the definition of existing issues change? Did *you* agree to these changes?
7. How clear was the definition of technical issues, from 1 = *totally obscure* to 10 = *completely clear*?

ties in each dispute, including the FWS, the state fish and game agency, and the applicant. Respondents were those who had been assigned by their organizations to actually conduct the negotiations. The interviews took place at the respondent's place of business (two were conducted via telephone) and ranged in duration from 1 to 2 hours.

Interviews were conducted after the negotiations had taken place. For three projects, we collected data at the end of the consultation, while related bargaining was still underway (Oswegatchie River; Ashton-St. Anthony; and Pit 3, 4, 5). For the other consultations, our interviews were conducted 3 years after completion of Koma Kulshan, 5 years after completion of Eastman Falls, and 3 years after completion of Cataract. This is similar to other research on actual multiparty negotiations (see, e.g., Bingham, 1986; Langbein & Kerwin, 2000). To help overcome the problem of bias due to imperfect recall, we used the documentation of each project to construct a detailed timeline of the consultations. We sent the detailed timelines to the respondents before each interview and requested that they review the timelines and suggest any needed changes. We then used the timelines as prompts when posing our interview questions.

The six cases provide a natural laboratory for investigating those multiparty natural resource negotiations in which technical information was a primary factor. Because of the regulatory framework of these negotiations, they represent more than only FERC consultations. For example, in implementing Section 404 of the Clean Water Act (1991), the Army Corps of Engineers is required to consult with the federal and state fish and game agencies (Cavendish & Duncan, 1986; Liebesman & Hundemann, 1992). Implementation of the Endangered Species Act (1973) is also basically a consultative process (Freeman, 1993; Yaffee, 1982). Like these other types of disputes, FERC negotiations involve questions about the distribution of benefits in a multiagency setting (Mnookin, 1993). Although analysis based on professional experience (e.g., Carpenter & Kennedy, 1988; Jung, 1995) provides valuable insight into multiagency negotiations, Langbein and Kerwin (in press) found that earlier research on multiagency bargaining was grounded more on theory or legal argument than on systematic empirical observation.

Interviewers included two representatives from a seven-member study team. The study team consisted of four social scientists, two hydrologists, and a biologist; all members of the team participated in at least one set of interviews. Interview teams were multidisciplinary in composition whenever possible. Our interview questions were referenced directly to our criteria for finding technical clarity and success. We used two stages of analysis to categorize responses according to these criteria: (a) evaluation of transcribed responses by the two-person interview team, and (b) review of transcripts and interview team evaluations by the entire study team. For each criterion, we selected example statements that typified respondent answers.

During the interviews, we asked respondents a series of questions to determine how clearly technical issues were defined during the negotiation process (see Table 1). Respondents' answers varied from (a) specific examples of how clearly the respondents understood the definition and scope of the issues and the required research, to (b) how clearly they understood the resulting data. We also asked respondents to rate technical clarity on a scale from 1 to 10, with 1

Table 2: Interview Questions Used to Measure a Successful Negotiation

1. Do you feel a *satisfactory agreement* was negotiated by the parties in the consultation process? Was anything important left out of this agreement? Did you ever have to renegotiate a point after everyone had agreed to it? If yes: What was happening then?
2. Did the license/application agreement include *procedures to implement* the project and mitigation actions agreed to? With authorities/responsibilities identified? With agreed on timing?
3. Did everyone agree to have the project operation monitored? If yes: Who was responsible for the monitoring? What kind of monitoring was agreed to?
4. Has this monitoring actually taken place?

5a. How will the relationships you developed with the other parties in these consultations affect how you proceed in future negotiations?

5b. Would you *go back* to the negotiation table with these same parties again? What would be your *incentive*?

6. Rate the *negotiated agreement* on this scale: 1 = *a complete failure* to 10 = *a complete success*.

A case was determined to have technical issues clarity when (a) all parties agreed to the definition of the technical issues throughout the process but especially during the stage when final agreement was being forged and (b) the definition of the technical issues was rated from *high* to *very high* . . . by all respondents.

meaning the issues were *not at all clear* and 10 meaning the issues were *perfectly clear.* During the interviews, we traced the history of each case to chronicle and measure changes in technical clarity over the course of the negotiation. A case was determined to have technical issues clarity when (a) all parties agreed to the definition of the technical issues throughout the process (but especially during the stage when final agreement was being forged) and (b) the definition of the technical issues was rated from *high* to *very high* (between 7 and 10) by all respondents.

Negotiation success is not clearly defined in the literature and is difficult to measure (Moore, 1996). In our study, interviewees were also asked to evaluate the success of each negotiation (see Table 2; Fulton, 1992; Burkardt, Lamb, & Taylor, 1995). Our criteria to evaluate success included (a) that the parties recognized that an agreement was reached, (b) that the agreement included a plan of implementation and postconstruction monitoring, (c) that there was a willingness to enter into future negotiations with the same parties, and (d) that respondents rated success at more than 7 on a 10-point scale (where 1 meant *no success* and 10 meant *fully successful*). The cases we studied varied both in success (from full to minimal) and in how well they met the criteria for technical clarity.

Findings

INCENTIVES TO NEGOTIATE IN THE FUTURE

As one measure of a successful negotiation we asked respondents whether or not they would be willing to negotiate again with the same parties. We also asked respondents to identify their incentives to enter into future negotiations (see Table 2). We found that all respondents indicated a willingness to go back to the negotiation table with the same parties. Much of the reason for their willingness to negotiate in the future was the FERC process itself: Parties recognized that there would be other FERC consultations with the same parties and that effective participation would require negotiation. In addition to the FERC process, many respondents said that they regularly negotiate with the same parties about other natural resource issues. This prospect of future negotiations with the same parties over different projects cast a long shadow over all the consultations we studied (Burkardt, Lamb, & Taylor, 1998).

Moreover, answers to the question about incentives to negotiate in the future led us to several conclusions about general incentives to negotiate (Burkardt et al., 1998). First, external factors (such as success in a concurrent negotiation) contributed to the desire to bargain. Second, the possibility of reaching agreement on some issues—even when the overall dispute might not be resolved—was an incentive. Third, parties wanted to negotiate when they perceived a shared feeling of heightened risk and responsibility. Finally, we found (Burkardt, Lamb, & Taylor, 1997) that a balance of power among the parties promoted negotiation.

EASTMAN FALLS PROJECT

Located on the Merrimack River in New Hampshire, the Eastman Falls project was distinctive in that it was one negotiation within the larger framework of the Merrimack River Comprehensive Fish Passage Plan. The major issue was upstream and downstream fish passage (i.e., the ability of fish to safely move past a dam). As part of negotiations on the Comprehensive Plan, a requirement for the project operator to install fish passage facilities had been discussed and agreed on before the application for a renewal license on the Eastman Falls project was filed. As a result of these earlier discussions, there was a great deal of clarity on technical issues before the license consultation began. Through the Comprehensive Plan, the parties had developed a clear understanding of the scope and scale of the issues as well as the appropriate methods to resolve those issues. Comments from two respondents illustrate the clarity of technical issues:

> Yeah, I think there was agreement on the technical issues, both with respect to instream flow and fish passage. As I said, there was agreement on the method to be used.

> Technical issues [were] very clear, just from the things that I've cited in the application, that they agreed before they even met with us . . . when I read this, I was pleased. . . . Basically, my little notes in the margin here were "concur, concur."

The high level of technical clarity in the Eastman Falls negotiations is illustrated further by the respondents' ratings. The average score for technical clarity in the consultation was 8.5. There were some technical controversies: For example, controversy surrounded the technical responsibilities of the parties, specifically in terms of jurisdiction. Members of the Technical Committee for the Comprehensive Plan formulated recommendations, which they passed on to the Policy Committee. The Policy Committee, in turn, constructed the Comprehensive Plan. In the Eastman Falls consultations that followed, the negotiators were bound to adhere to the terms of the Comprehensive Plan. However, some Eastman Falls negotiators believed that they should have been part of the Technical Committee because they were the appropriate parties to provide input on technical issues and boundaries. In fact, the usual practice was for these negotiators to take the lead in formulating technical recommendations, and the reversal in roles was a stumbling block in completing the consultation. However, overall, the parties agreed on what should be studied and how those factors should be investigated (values). They understood the results of the studies and believed that within the constraints of the Comprehensive Plan, the findings provided opportunities for gain. In large measure because of the existence of a Comprehensive Plan, the technical issues were framed positively.

We judged this negotiation to be successful. There was complete agreement on resolution of the issues and a strong commitment to implement. All parties were willing to negotiate again and respondents reported that relationships improved. Success scores ranged from 7 to 10.

KOMA KULSHAN PROJECT

Like the Eastman Falls project, Koma Kulshan had a distinctive characteristic. This characteristic was that the consultations' main issues—stream flow (how much water should remain in the bypassed reach), sedimentation (how much sediment would be washed into a downstream lake), and public access to the small reservoir created by the project—were fully resolved in the course of the negotiations. The respondents credited this to the fact that the physical and biological impacts of the project were expected to be minimal. Once the parties realized the straightforward nature of the environmental effects, little conflict ensued. Developing that realization was not easy. Agreeing on a resolution required numerous meetings over several years in which the participants learned to work together, developed a shared technical understanding of project operations (including the difference between pre- and postproject conditions), and constructed a solution. One respondent summarized technical clarity well when he said,

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> It [cumulative impact assessment] is a valid issue. What I did have trouble with is that no one could really define what they meant by "cumulative impact." I'd say "OK, what do you want us to do? What is it that you're really concerned about?" When we finally did get things pinned down, it came down to sediment, that was the major thing; that was something that was tractable.

Located in a remote area on the Sandy and Sulphur Creeks in the state of Washington, the Koma Kulshan project consisted of a water diversion structure and a penstock transferring water to a power-generating station. The technical problems in this project proved amenable to resolution. For example, the proposed site for the penstock was occupied by a plant on Washington's list of threatened species. Because an alternative site was available, the penstock could be built at a second location. Another problem entailed the effects on trout of altered stream flow in the two streams. Although the parties differed regarding the methods to investigate these impacts, the problem was tractable because so few fish were found in the streams. Finally, the major technical sticking point proved to be sediment transport. As a result of the effective working relationship that had developed over several years of negotiation, the parties were able to develop a means to resolve this issue. Numerical ratings indicated that by the time the consultation ended, all of the respondents considered the issues to be clear. Although working out an agreement on what to study required considerable time, the parties mutually understood the scope of the project (values), and findings of the fisheries studies (facts) proved that few fish would be affected. Other issues such as the site of the penstock (facts) were also presented as an opportunity without potential losses. Sediment issues were more difficult, but the parties seemed to believe that the studies would yield options.

We found that the negotiations over Koma Kulshan were successful. All parties believed that a successful agreement was reached. Eight of the 10 parties stated that the final agreement contained provisions for monitoring; other parties did not recall. Each interviewee reported a willingness to negotiate again. Success scores ranged from 5 to 10 with 8 of the 10 respondents rating success at 7 or higher.

OSWEGATCHIE RIVER PROJECT

The Oswegatchie River Project in New York encompasses six dams located on a 70-mile stretch of river. The project consists of a series of power stations and penstocks that bypass the natural river channel. The principal issue in this negotiation was stream flow in the bypassed reaches. An understanding of the scope and effect of this issue was shared by the parties and was believed to be the only important technical issue. The parties were able to reach agreement on all but one of the bypassed reaches. On this one reach, they submitted differing recommendations to the FERC, which made the final decision. One respondent recalled,

> I think [the technical issue] was pretty well defined. The issue was flows in selected riverine reaches. And there's no question, we all knew what the issue was; I think it stayed focused. It didn't waver, which was unique. But, of course, this was intended to be sort of a one-issue consultation.

Conflicts that manifested themselves as technical differences actually reflected a reluctance to compromise closely held values.

Although the question of appropriate flows in the contested bypass reach was clear in the sense that everyone knew that flows in that reach were a stumbling block to agreement, the parties struggled over how to conduct the studies and interpret the results. The struggles among the parties reflected strongly held differences in goals for operation of the project: whereas some parties sought to maximize generation efficiencies, others attempted to maximize instream benefits. Conflicts that manifested themselves as technical differences actually reflected a reluctance to compromise closely held values. The question of flows in the last stream reach remained intractable because there were no identifiable physical alternatives. Moreover, each party believed it would prevail when the issue was elevated to the FERC.

In an effort to bolster its position late in the consultation, the state sought another mechanism to impose its instream flow requirement on the other parties. One mechanism available to the state was Section 401 of the Clean Water Act (1991). Under that section, the state is required to

issue a water quality certificate indicating whether the project as planned would violate state water quality standards. If a state finds that water quality standards will be violated, it may include provisions in the certificate to protect water quality. The FERC must follow the requirements in a state's Section 401 certificate. In this case, New York State included an instream flow requirement in its certification, an action that the utility protested.

Numerical scores for technical clarity were high, with a mean overall score of 8. This high score demonstrates that the parties understood the nature of the impasse. The parties recognized that there were conflicting values, and they did not believe that study results (facts) would lead to potential solutions. Technical considerations were not able to frame the negotiation positively.

Although success scores ranged from 7 to 8, we judged the negotiation to be minimally successful. Agreement was not reached on all points: The state Section 401 water quality certification and instream flows were unresolved, and the FERC order was contested. Implementation was not a major issue in the negotiation, but monitoring was included in the FERC order. All parties reported a willingness to negotiate again.

CATARACT PROJECT

Ratings for technical clarity in the Cataract Project changed dramatically at different times during the negotiation. Cataract is the impoundment (i.e., reservoir) farthest downstream on the Saco River in southern Maine. Water released from the project travels a short distance before emptying into the estuary of the Saco. In the early stages of the consultation, the parties shared an understanding that the issues included (a) instream flow for Cataract and seven upstream impoundments, (b) the need for a comprehensive river plan, and (c) fish passage. Understanding these issues did not preclude disagreement. For example, the exact details of a comprehensive river plan were contentious because the parties could not resolve the question of how far upstream fish passage facilities needed to be constructed.

After the project proponent completed the license application, additional conflicts arose as some of the existing issues became clearer. For example, the fish passage issue became clearer through a mutual agreement that set an approach to resolving the problem. But, in this phase, one party introduced the issue of flow releases for waste assimilation downstream of the dam in the form of a state Section 401 water quality certification. Introduced late in the consultation process, this new issue surprised other parties. Uncertainty about state Section 401 certification surfaced in discussions about whether the state agencies had the authority to include stream flow as a part of their Section 401 certification and whether the FERC was bound to include the Section 401 certificate in the license. Because the answers to these questions were unclear, the parties responded with low ratings in our quantitative measure of technical clarity. But, in the final phase—after a license was issued—technical clarity was reported as high even though the Section 401 flow issue remained unresolved.

As time passed in the Cataract negotiations, some issues were clarified, some muddied, and some discarded. Most disagreements about technical issues turned on how to make decisions, resolve problems, choose methodologies, and interpret results. The parties understood the issues but could not agree on how to resolve them. One reason for this was that the applicant and some of the parties to the Cataract consultation were simultaneously involved in a very contentious general stream negotiation about the Kennebec River, a process that led to skepticism about the Cataract process. The following exchange characterizes the respondents' conclusions about this negotiation:

Q: Once established, during that first phase, was the understanding of what the technical issues were ever lost?

A: I think what the consultation does, and certainly what it did in Cataract, is it better defines [issues]. As we went through this process, we better defined maintenance drawdown as a potential habitat concern. Better defined certain fish passage issues. So I don't think anything was lost, just better defined, which is the goal of that process.

The Kennebec River negotiations set the stage for those that occurred on the Cataract project. The technical issues did not frame a positive negotiation because disagreements over central value questions removed the possibility of studies that could illuminate potential options for resolution. The highly contentious nature of the Kennebec River negotiations meant that the parties understood all too well the likely results of any research efforts. The conflicting values were clear, and that clarity prevented fruitful bargaining.

The highly contentious nature of the Kennebec River negotiations meant that the parties understood all too well the likely results of any research efforts. The conflicting values were clear, and that clarity prevented fruitful bargaining.

We rated the Cataract project as minimally successful (success scores ranged from 2 to 9). Not all parties believed that a satisfactory agreement was reached. Although procedures to implement agreements were included for those issues on which there was agreement, the state Section 401 water quality certification, fish passage, and instream flow remained unresolved issues. However, all parties reported a willingness to negotiate again.

ASHTON-ST. ANTHONY PROJECT

Located on the Henry's Fork River in southeastern Idaho, the Ashton-St. Anthony Project consists of two developments: a dam, reservoir, and powerhouse near the town of Ashton, and a diversion dam, canal, and powerhouse within the city limits of St. Anthony. The project was constructed in the mid-1910s, later acquired by a large regional utility, and then scheduled for relicense in 1984. Under FERC rules of that period, the relicensing presented an opportunity for a municipality to obtain the new license (to the detriment of the utility).

Because of this competition, the utility sought to streamline the relicensing process by simplifying many technical issues. As the consultation progressed, it became obvious that the utility's application would prevail over any competitor's, and the negotiations over technical issues became more intense. In the early stages, studies were agreed to without discussion of the eventual interpretation of the resulting data; in some cases, there seems to have been no mutual understanding of the purpose of the studies.

The license was issued on the condition that further studies would be undertaken. During this second phase, there was a lack of agreement on the use of scientific techniques. Although the parties agreed (a) that fish entrainment and turbine mortality of native fish were issues and (b) that studies of those phenomena should be conducted, they failed to agree on how to quantify losses of native fish due to those causes, and they did not discuss how data were to be interpreted. It was during this second phase, too, that the parties realized that some of their early assumptions about technical matters had not been shared by others. For example, the state department of fish and game was asked to study the reservoir fishery. After the study was completed, there was disagreement on study scope, results, and reporting procedures. One respondent reported skepticism about negotiations over technical issues:

> That's why I say that technically it appeared that a lot of these issues were not based on any type of real studies or a management objective. They appeared more like a biologist's or some manager's hunch that, I think this is what happened, and at this point in time, we really need more wetlands, or that our focus is on improving deer winter range, so we need more of this or more of that, and so that's what we ought to call for as far as mitigation, when it comes to hydro projects.

The uncertainty of the consultation process initially led the parties into a holding pattern of conducting studies without first exploring all the values issues. . . . The presentation of study results was negative in that findings pointed out potentials for loss and were followed by a lack of willingness to compromise.

Another important factor in this consultation was that the statute guiding the FERC's licensing activities was amended by the ECPA in the middle stages of this negotiation, causing all parties to be unsure of the process. The uncertainty of the consultation process initially led the parties into a holding pattern of conducting studies without first exploring all the values issues. This resulted in reports (facts) that did not point toward options for resolution or that were themselves the subjects of immediate debate, including cross-claims of studying the wrong subjects or using the wrong methodologies. The presentation of study results was negative in that findings pointed out potentials for loss and were followed by a lack of willingness to compromise.

These negotiations were also judged to be minimally successful (success scores ranged from 3 to 10). Only parts of an agreement were finalized. Fish passage, entrainment, and wetlands

protection were unresolved issues. Agreements that were reached included some implementation and monitoring. All parties reported a willingness to negotiate again.

PIT 3, 4, 5

The Pit River in northern California empties into the Shasta Reservoir on the Sacramento River and is marked by a series of hydroelectric projects. Each project consists of a dam with a downstream reach bypassed by a penstock. Pit 3, 4, 5 is a series of three diversion structures, bypass reaches, and power stations. The project directly affects more than 62 kilometers of river.

Respondents in the prelicense phase reported three phenomena: (a) confusion on what they were trying to accomplish with the consultation, (b) agreement on some issues to study, and (c) disagreement on where studies would lead the parties. One exchange with a respondent illustrates the confusion:

Q: But during this time . . . was there a lack of clarity among the parties with regard to the issues themselves, what the issues were?
A: You bet. And I think a lot of it was confusing because you had archaeological concerns. You had that whole can of worms . . . going on at the same time, and Exhibit R tying to Exhibit S. A lot of people didn't understand where we were in the process, and sometimes . . . there was confusion.
Q: Was there a time . . . up until the issuance of the license, where the parties did come together and agree, then, what were the issues?
A: No, I don't think anybody ever said, "These are the 20 issues we've got." . . . You had this meeting for this reason, this meeting for that reason . . . and nobody was ever sitting down and tying them all together.

This confusion was due to uncertainty over how to handle the resolution of technical questions and how to move forward. The parties looked to the FERC for leadership but found little, and the direction provided by the applicant did not seem to lead to timely results. Confusion did not arise from disputes over which studies to conduct. Rather, after completing the studies, the parties still did not agree on how to interpret the results.

The postlicense phase was marked by studies designed to meet license requirements and agreements on several outstanding issues. But the issue of flow release in the Pit 3 bypass reach had not been resolved. After the flow studies were completed, the parties could not agree whether the flows had been established to promote trout habitat or eagle foraging on a fish species known as the Sacramento sucker. Even within the internal deliberations of one of the parties, there was no agreement about this question. Moreover, although the parties did agree that eagle foraging was one important factor, they could not agree how much use by eagles constituted foraging: Did one eagle taking one fish constitute foraging, or did foraging require a group of eagles making regular use of the reach?

Of the six cases we studied, Ashton-St. Anthony and Pit 3, 4, 5 demonstrated the lowest levels of technical clarity. In Pit 3, 4, 5, the parties were unable to agree on the biological focus of their studies: Were they analyzing trout habitat or foraging opportunities for eagles? These were the basic value questions that required answers before negotiations could be fruitful. One reason they could not agree on these value questions was that the parties believed that the answer would cast the negotiations into a negative context. Partly in response to this belief, the parties agreed to proceed with site-specific studies as a means to avoid discussing the ultimate value questions. Studies that were conducted did not assist the parties in resolving the value questions. Negotiation behavior in this conflict was uncompromising and competitive.

We rated this negotiation as minimally successful (success scores range from 1 to 7). Agreement was not reached on flows, and the FERC order was contested. Implementation was included on those issues agreed to; monitoring was a part of the FERC license. All parties reported a willingness to negotiate again.

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Discussion

Of the six projects, we evaluated two as fully successful (Eastman Falls and Koma Kulshan) and four as minimally successful (Oswegatchie, Cataract, Ashton-St. Anthony, and Pit 3, 4, 5). In the two fully successful cases, value questions were resolved, and that resolution helped guide the technical studies. In two cases that were less successful, the value issues were clear, but that clarity was not achieved through bargaining. Rather, circumstances made perceived outcomes obvious, and technical studies could not change those perceptions. In the final two cases, both values and facts were unclear.

The two successful cases were the ones in which technical clarity was most evident. Although successful, these two consultations displayed unique distinguishing features. In Eastman Falls, the key feature was the earlier negotiation of a comprehensive plan covering fish passage requirements for the entire river. Mitigation steps required of the Eastman Falls project proponent were understood in advance, and the consultation was a matter of conforming to the plan. This meant that the technical questions cast the negotiation in a positive light that emphasized the opportunities for gain.

In Koma Kulshan, the issues were stream flow, sedimentation, and public access. Unlike Eastman Falls, there was no previous agreement on these issues. The parties had to decide what the problems were, determine appropriate studies to evaluate alternatives, and design a solution. All of this required considerable time. Because the project was not yet built and did not face the deadlines imposed by relicensing regulations, the parties had the luxury of time to develop a solution. Although the parties were interested in completing the consultation, several nontechnical issues delayed the process. However, the delay allowed time to develop trust-based working relationships and cast studies in a positive context. Finally, a common perception developed among the parties that the environmental losses would be very small.

In both of the most successful cases, the technical issues came to be seen by the parties as straightforward. The parties believed the issues were amenable to analysis that would identify options rather than obstacles.

One feature that set these negotiations apart from those that were less successful is that the parties shared an understanding of the positive benefits of answering the technical questions. Langbein and Kerwin (2000) found that participants in multiparty environmental negotiations believed they learned more from the bargaining than did participants in traditional, hierarchical rule making. But they also found that the positive feeling did not necessarily translate into a successful negotiation. In contrast, the most successful cases we studied manifested a shared understanding of technical facts and values. In both of the most successful cases, the technical issues came to be seen by the parties as straightforward. The parties believed the issues were amenable to analysis that would identify options rather than obstacles.

The parties in both consultations were able to resolve (Koma Kulshan) or already had resolved (Eastman Falls) the technical questions related to the heart of the negotiation, which could be summarized as, What is the extent of adverse environmental effects? That is to say, they resolved the value questions about the project. Simon (1976) observed that every decision contains both fact and value elements. Factual propositions are those things that can be objectively tested, whereas values are statements of what ought to be. In the negotiations we studied, values were addressed in the form of professional judgments. They were ethical decisions that "cannot be described as correct or incorrect" (Simon, 1976, p. 50). One of the most difficult tasks in the consultations we studied was for the parties to arrive at some ethical premise that would guide their negotiations. In the successful negotiations, the parties were either given or developed the goal that the license should be granted. Reaching this shared vision was made easier because the technical issues were straightforward, results illuminated options for resolution, and the environmental effects seemed minor.

In the unsuccessful negotiations of Oswegatchie and Cataract, the technical issues—and to some extent the consultation process—were clear and the value differences well recognized. Partly because it was clear to everyone that choosing objects of study immediately constrained the available options for resolution, the parties could not agree on their professional judgment of what should be studied. For example, in Oswegatchie, flows in one bypassed reach were the key to resolving the conflict. The parties differed on the effects of these flows: The utility believed that releasing the flows significantly reduced the profitability of the project, whereas the agen-

cies believed that flows in the bypassed reach were essential for fisheries and recreation. The parties in Cataract and Oswegatchie did not want to discuss the facts because they understood all too well the meaning of their disagreement on values.

Ashton-St. Anthony and Pit 3, 4, 5 provide examples of unclear technical issues, opposing values, and a muddy consultation process. In Ashton-St. Anthony, none of the parties was able to articulate clear management objectives, other than the utility's aim to relicense the project. All of the parties expressed confusion about how to conduct the consultation. Studies were undertaken without agreement on purpose or method. Steps were taken to conduct studies, acquire lands, or perform other mitigation activities without a clear connection to goals beyond meeting milestones in an uncertain process. In Pit 3, 4, 5, instream flow studies were undertaken because it was understood that such studies had been required in other cases. But there was no agreement on the management objective of the studies—that is, eagle forage or trout fishery. The parties also did not understand the FERC process for licensing consultations.

Conclusion

The most successful negotiations we studied focused on two technical elements: (a) coming to agreement on desirable conditions (values) and (b) selecting and conducting studies resulting in facts that contributed to a positive context of negotiation. In the least successful negotiations, parties attempted to force acceptance of their versions of project operations without resolving—and in some cases, without even clarifying—their values. In those cases, technical studies were intended to set the stage for a limited suite of outcomes. Thus, technical options and results were presented in a way that cast the negotiations in a negative light and emphasized the significance of loss. In the least successful cases, negotiators often plunged into their task without clearly defining the problem, hoping that a series of studies would illuminate the best course of action. Rather than leading to a solution, this most often demonstrated how hard the bargaining would be and highlighted the risks of compromise.

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