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ORGANIZATIONAL ESCALATION AND EXIT: LESSONS FROM THE SHOREHAM NUCLEAR POWER PLANT

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Although there is a relatively large literature on escalating commitment, almost all the research it describes has concerned individuals rather than organizations. Therefore, to provide additional grounding for an organizational theory of escalation, we examined the Long Island Lighting Company's decision to build and operate the Shoreham Nuclear Power Plant. Shoreham's cost, estimated to be $75 million when the project was announced in 1966, rose over the next 23 years to over $5 billion. A negotiated agreement with New York State finally resulted in Long Island Lighting's abandoning Shoreham without its ever having begun operation. Examination of the Shoreham decision provided support for a temporal model of escalation and helped us develop new theory on how escalation episodes may ultimately be resolved.

Much of organizational theory can be reduced to two fundamental questions—how do we get organizations moving, and how do we get them stopped once they are moving in a particular direction?

Although the above statement is an oversimplification, it does focus attention on a fundamental dichotomy in theory as well as on an imbalance in the current research literature. The vast majority of organizational studies have been devoted to understanding why and how organizations initiate action; they range from individual-level studies on motivation, through group research on decision making, to the examination of organizational design and strategy as a response to environmental conditions. Far less attention has been devoted to understanding and resolving pathological organizational persistence. The implicit assumption has been that, should organ-

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izational actions and programs overshoot their mark, such persistence will eventually be curbed by market forces.

One area of research that has directly examined the ending of organizational programs is that on the escalation of commitment. Over the past 15 years, a series of experiments has documented a tendency for individuals to become locked into losing situations, in a sense "throwing good money after bad" (e.g., Brockner & Rubin, 1985; Staw, 1976; Teger, 1980). However, so far, nearly all this research has centered on individual behavior and has been based on short-term laboratory experiments. Little research has examined how organizations become committed to losing courses of action over time, tracing such commitment from initial project outlays through the receipt of substantial losses.

THEORETICAL BACKGROUND

It can be argued that major organizational decisions to persist or withdraw from a course of action are far more complicated than the escalation literature often implies. Organizational escalation decisions may involve numerous variables at multiple levels of analysis. Such decisions may also be more dynamic than those represented in the experimental literature, since the influence of various determinants of escalation may change over time. Thus, in earlier work (Staw & Ross, 1987), we proposed that organizational escalations may involve the interplay of four sets of forces over time.

Determinants of Escalation

Project determinants. Under this rubric are objective aspects of a project, such as its closing costs, its salvage value, the causes of setbacks to its completion, and the economic merits of pursuing or dropping it; Northcraft and Wolf (1984), McCain (1986), Bateman (1983), and Staw and Fox (1977) give examples of research on project variables.

Psychological determinants. This category includes "reinforcement traps" (Platt, 1973), such as difficulties in withdrawing from a previously rewarded activity; individual motivations, such as the need for self-justification; decision-making errors, such as trying to recoup "sunk costs" (resources already invested in a project); and biases in information processing, such as tendencies to slant data in the direction of preexisting beliefs. Goltz (1992), Staw (1976), Arkes and Blumer (1985), and Conlon and Parks (1987) provide examples of research on psychological determinants.

Social determinants. Included here are interpersonal processes that may lead to excess commitment, such as desires to justify losing projects to potentially hostile audiences (Fox & Staw, 1979), modeling of others' behavior in similar circumstances (Brockner, Rubin, & Lang, 1981), and cultural norms favoring consistent, or strong, leadership (Staw & Ross, 1980).

Organizational determinants. Under this category come such variables as the level of political support for a project within an organization (Pfeffer, 1981), the level of economic and technical "side-bets" incurred by the organ-

ization with respect to the project (hiring of staff, development of expertise) (March, 1978), and the extent of the project's institutionalization within the organization—how tied it is to the firm's values and objectives (Goodman, Bazerman, & Conlon, 1980).

Mapping the Forces of Escalation

Figure 1 shows a temporal model depicting organizational escalation as a four-stage process (Ross & Staw, 1986; Staw & Ross, 1987). Examining the top half of the figure shows that the typical escalation episode can be seen as beginning with the bright promise of future outcomes through a given course of action. The course of action gradually but progressively becomes a losing proposition during the second and third stages, ending in the fourth stage with substantial negative results. Although one might expect individuals and organizations to flee from such a losing situation, the temporal model shows that countervailing forces tend to build up over time, making it more difficult to withdraw than would be expected if only economic results were considered. The model shows that psychological, social, and organizational forces tend to be most influential at the early, middle, and late stages of an escalation episode, respectively. Project variables appear to be most important at both the early and late stages of an episode. We can summarize the temporal model of escalation with the following propositions:

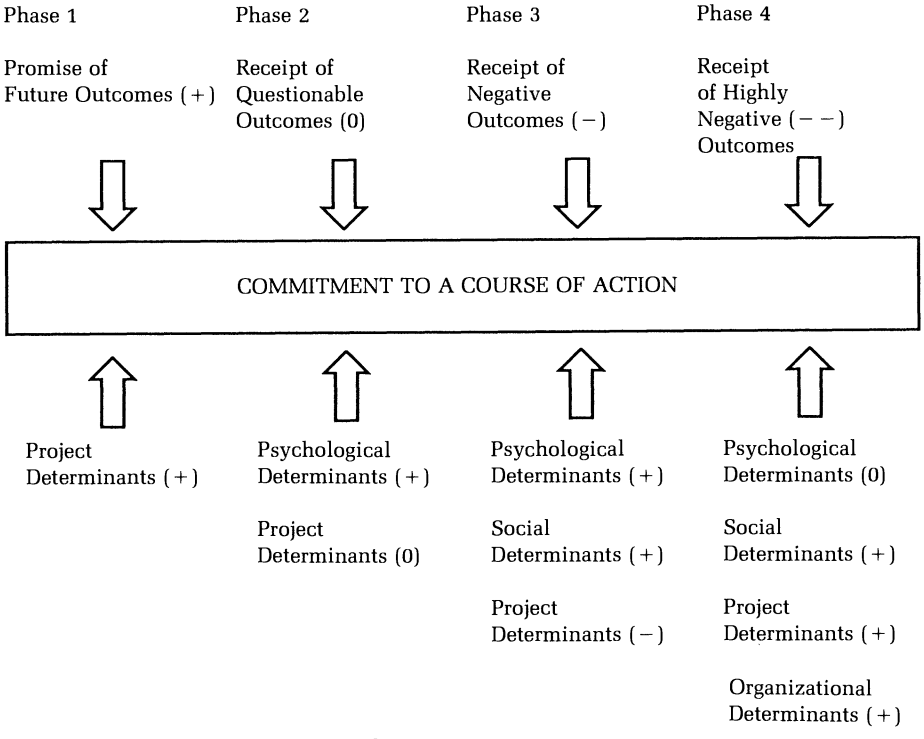
> *Proposition 1: Organizational escalation is determined by a combination of psychological, project, social, and organizational determinants.*
>
> *Proposition 2: There is a temporal ordering in the influence of the determinants of organizational escalation—project variables are most important at the early stages of an escalation episode, psychological and social variables are dominant at the middle stages, and both organizational and project considerations become most influential at the late or ending stage of the typical escalation episode.*

The Need for Further Research

Although Figure 1 and the propositions based on it make conceptual sense, the empirical support for the temporal model of escalation is still somewhat weak. So far, the only empirical study of organization-level escalation has been our case study of British Columbia's decision to hold a world's fair, "Expo 86" (Ross & Staw, 1986). Because the temporal model of escalation was essentially based on this case study, our two propositions have not yet received an independent test. The case study described herein, which concerns a project of the Long Island Lighting Company (LILCO), the Shoreham Nuclear Power Plant, was designed to provide such an independent test of Propositions 1 and 2, as well as an exploration into exit processes not addressed by the temporal model.

The present article examines organization-level escalation by presenting

FIGURE 1
A Temporal Model of Escalation[a]



[a] This model is drawn from Staw and Ross (1987).

a detailed case study of investment in a nuclear power plant. The importance of such a presentation is twofold. We could easily argue, as have some business journalists, that the failure of the U.S. nuclear program ranks as the largest managerial disaster in U.S. business history (Cook, 1985). On those grounds alone, any case study shedding light on such an important problem would be worthwhile. Second, as we have noted, the escalation area is in dire need of further grounded research. Not only was the only existing case study (Expo 86) used to derive rather than test the temporal model of escalation; some unique aspects of that case may constrain its generality. Expo was a self-terminating construction project, ending by design after the summer of 1986. Therefore, it was impossible to study the dismantling of an ongoing project or course of action using Expo 86. Since escalation research is as much concerned with how organizations get out of losing courses of action as with how those courses expand over time, it is important to examine projects that are not self-terminating. LILCO's Shoreham Nuclear Power Plant constitutes such a case.

THE SHOREHAM CASE

Theory Testing Versus Theory Building

In the literature on organizations, case studies are typically considered a forum for theory construction rather than testing. Therefore, case researchers are often cautioned either to come to the field without preconceived hypotheses (Schwartz & Jacobs, 1979) or to cycle continually between data and theory (Glaser & Strauss, 1967). In contrast, other social sciences use single and comparative case studies as a principal means of theory testing, with the corresponding caveat that hypotheses be stated up front (Bryman, 1988).

In the Shoreham case, we engaged in both theory testing and theory building. We came armed, up front, with the temporal theory derived from earlier research, seeking to test the generality of our two stated propositions. However, as noted above, we also came to the Shoreham study with a certain degree of skepticism about the generalizability of the temporal model. In addition, because the a priori model was not designed to explain the exit of organizations from escalation situations, we hoped to use the Shoreham case to build new theory on organizational exit.

For the theory-testing part of this research, we used a variant of qualitative pattern matching between theory and data. As Campbell (1975) and Yin (1989) noted, pattern matching can be performed using variation on either dependent or independent variables. For example, when a set of nonequivalent dependent variables is predicted and found to result from a particular treatment or process, an investigator can be relatively confident that such an effect has indeed occurred. Likewise, if a consequence is predicted and found to result from a particular array of nonequivalent independent variables, a strong inference can similarly be made.

In the Shoreham case, the dependent variable constituted an increasing expenditure of resources for a nuclear reactor that was never placed into operation. Our test of Propositions 1 and 2 consisted of finding out whether the hypothesized set of independent variables was present before and during the escalation of commitment at Shoreham and whether those independent variables were indeed ordered as shown in Figure 1. Thus, the theory-testing part of this case study used pattern matching on nonequivalent independent variables in testing the propositions.

A more fluid form of pattern matching was also used to build theory about the exit of organizations from escalation situations. We not only examined archival and interview data to discern their fit with the a priori hypotheses, but also used those sources of information to derive an understanding of organizational escalation and exit not necessarily predicted in advance. As Glaser and Strauss (1967) and Elsbach and Sutton (1992) recommended, we used a less linear approach with the theory-building aspect of the study, moving back and forth between the empirical data and possible theoretical conceptualizations. Our goal was to comprehend as fully as we

could the events of Shoreham and to match those events with potential models of escalation and exit.

Data Sources and Methods

To begin our study of the Shoreham case we first consulted published reports on the plant and LILCO. This was no small task since the Shoreham case was a major financial disaster chronicled in detail by the popular press. One reason for this heavy reporting was the plant's location on Long Island, close to the media center of New York City. We therefore consulted hundreds of articles on Shoreham published by the *New York Times* (specific citations appear in the case description); numerous articles in *the Wall Street Journal* (e.g., 1977, 1979, 1982, 1983, 1984a, 1984b, 1985a, 1985b, 1986, 1987, 1988, 1989a, 1989b); reports published in other national periodicals (e.g., *Nation,* 1986; *National Review,* 1988; *Nature,* 1987); a detailed book on LILCO (Grossman, 1986); more general books on the U.S. nuclear industry (e.g., Ford, 1986; Komonoff, 1982; Pringel & Spiegelman, 1981); and numerous pamphlets, memoranda, and internal LILCO documents not generally available to the public. The first author examined all the material and sent photocopies of the most important pieces to the second author. Site visits to the plant and the village of Shoreham soon followed.

In the initial site visit, the Shoreham–Wadding River Public Library was used to obtain further material on the nuclear plant. The library contained a wealth of unpublished documents from court and administrative hearings relevant to the licencing of the Shoreham plant. A second visit was then scheduled to interview participants in the Shoreham case and informed observers. Interviews were arranged with individuals who were either frequently mentioned in published reports about Shoreham or were authors of major accounts of the nuclear plant. These included both LILCO spokespeople and individuals who were long-time opponents of Shoreham. At the end of the sessions, interviewees were asked to suggest other individuals who would be important sources for understanding the events of Shoreham. There was a high degree of consensus among both LILCO advocates and opponents about who were important actors in the situation. Twenty-one individuals were subsequently telephoned and told that we were gathering information for an academic article on the Shoreham plant. Of the 21 individuals, 4 declined to be interviewed, 2 without specifying why, 1 because he was involved in his own writing project related to Shoreham, and 1 because he could not be scheduled for an interview. Of the remaining 17 sources, 9 were interviewed in person and 8 were interviewed exclusively by telephone. The interviews averaged about one and a half hours in length, ranging from 20 minutes to four hours.

The focus of the interviews was the person's own experience with the Shoreham project. The interviews were primarily open ended but always included some of the same general questions; examples are "When did you become involved in the Shoreham controversy?" "What was the nature of your involvement?" "Was Shoreham initially a good idea?" "When, if at all,

did it stop being a good idea?" "Why did Shoreham end up costing so much?" "What led LILCO to continue with the plant?" Some specific questions asked of many, but not all, participants included the following: "Did it matter who was in charge of LILCO?" "What role did the federal government play in Shoreham?" and "What do you think about the agreement to dismantle Shoreham?" At the end of the sessions, interviewees were asked, "Who disagrees with you about this?" in order to check on the representativeness of our coverage of Shoreham. Although there was a set of prepared questions for each interview, the material discussed invariably stretched beyond these initial inquiries. The goal of the interviews was to assist us in formulating a detailed history of the Shoreham decision, as perceived by the informant. Although occasionally we wished to discuss specific incidents or issues with particular informants, the general focus was on understanding the decision context and the historical unfolding of events. One individual requested the interview be kept "on background," and others at various points requested that some specific comment or speculation be off the record. Such concerns were rare but have of course been honored in the account that follows.

Written notes were taken during each of the interviews, which were conducted by the first author. We then worked together in combining interview material, background documents, and the extensive published information to produce an outline of the events of the Shoreham case. Next, we compared Shoreham to the a priori model. For each of the determinants of the temporal model, we discussed whether particular variables were present in the Shoreham case, how important they were, and when they were of importance. This pattern fitting was made easier by the multitude of data on Shoreham. In fact, we only drew conclusions about a determinant of escalation if evidence from multiple sources pointed to such an inference; for instance, numerous articles and interviewees mentioned the psychological commitment of the former chief executive of LILCO. Thus, the reader should keep in mind that when a quotation is provided for interpretation of the case, it illustrates that further evidence was available.

Although many of the a priori determinants appeared to be present in the Shoreham case, several new elements also emerged from the interviews and written accounts of the plant. This was especially true concerning the broader contextual determinants of escalation and the process of organizational exit. For these new topics, we moved back and forth between our data and new conceptual categories in an effort to form grounded theory (Glaser & Strauss, 1967). In formulating theory on organizational exit, we also gathered new data from follow-up interviews, conducted via telephone, and additional business press articles on the most recent events at Shoreham.

For several reasons, the Shoreham case allowed us to make inferences that are relatively strong, in a logical rather than a statistical sense. First, the dependent variable was not an ephemeral phenomenon, like variables such as values or organizational culture so often studied by qualitative research. Instead, there was a physical structure that cost $5 billion—one that would

eventually be decommissioned without ever having begun operation. Second, the basic facts of the Shoreham case are objectively verifiable. Although the nuclear plant has generated enormous political controversy, the size of Shoreham's losses (see Table 1) and the set of events leading up to this disaster are not themselves in dispute. Finally, evidence on the independent variables, the determinants of escalation, was assembled from multiple sources, many of whom were arms-length observers of the phenomenon. Unlike most case studies, this report does not rely solely on the researchers' field notes or interpretations, since readers can consult the many publicly available reports on Shoreham.

The description that follows is a summary of the events that occurred from Shoreham's inception to its closing. Although this summary is incomplete because of space limitations, it does include the major elements of the story. The reader is warned that we will not subsequently interpret every event of our Shoreham description, since no theoretical framework can hope to explain more than a portion of a complex history spanning many years. Highly abbreviated case studies may sometimes give the impression that a total explanation is possible, since many events not fitting a particular theoretical model are left out of the description. In the following description, we try to retain some of Shoreham's natural complexity. Although we have only cited coverage by the *New York Times* for each major phase of the Shoreham project, the case description is based on the full range of data sources available to us.

TABLE 1
Selected Cost Estimates for the Shoreham Nuclear Power Plant

Date	Cost Estimate	Projected Completion and Operation
April 14, 1966	$65–75 million	1973
September 20, 1970	250 million	1975
December 19, 1971	271 million	1977
December 5, 1972	350 million	1977
April 1, 1973	506 million	1978
April 1, 1974	695 million	1978
April 1, 1976	969 million	1978
March 7, 1979	1.3 billion	End of 1980
June 4, 1979	1.5 billion	December 1981
April 15, 1980	2.2 billion	Late 1982
December 27, 1981	2.5 billion	1983
November 4, 1982	3.1 billion	1983
November 28, 1983	4.0 billion	Complete but not ready
February 24, 1984	4.1 billion	July 1985
June 1, 1985	4.3 billion	October 1985
November 11, 1985	4.5 billion	
September 20, 1987	4.6 billion	
December 13, 1987	5.0 billion	
March 18, 1988	5.2 billion	
March 1, 1989	5.5 billion	Agreement to abandon

A BRIEF HISTORY OF THE SHOREHAM PLANT

A Modest Proposal

On April 13, 1966, the Long Island Lighting Company announced plans to construct a nuclear facility in Shoreham, New York, a small town 55 miles east of Manhattan. It was anticipated that construction of the plant would begin in late 1969, with service beginning in 1973. The plant was to cost between $65 and $75 million to construct and would have a capacity of 540 megawatts. Initial local reaction to the Shoreham proposal was quiet and modestly favorable (*New York Times*, 1966).

In 1967, LILCO announced plans for an additional nuclear facility to be constructed in Lloyd Harbor, another Long Island town, and received quite a different response. Local residents organized and formed a research and lobbying group, the Lloyd Harbor Study Group, in opposition to the nuclear plant. Although LILCO let the Lloyd Harbor project drop and turned its attention to Shoreham, the newly organized and adamantly antinuclear group also turned its attention to Shoreham.

Early Resistance

In 1969, LILCO changed the design of the Shoreham plant from a projected capacity of 540 megawatts to 820 megawatts on the basis of anticipated energy demand and economies of scale. The plant cost estimate was raised to $261 million, and the completion date was pushed to 1975.

Public hearings on the Shoreham project began in March 1970 and lasted nearly three years. These hearings were a prerequisite to the project's licensing by the U.S. Atomic Energy Commission (AEC). Opponents called dozens of witnesses and raised a wide range of concerns about the plant. By comparison, two similar AEC application processes a year earlier in Oregon and Tennessee had lasted only three and four days respectively. In the end, the AEC recommended that LILCO be allowed to construct the Shoreham facility. But by the time the Shoreham construction permit was finally granted, on April 13, 1973, LILCO had already spent $77 million on preparations and obtaining approval for the plants—more than the original estimate of the entire cost of construction (Grossman, 1986: 130).

Construction Begins

With the granting of the construction permit, much of the intense opposition to Shoreham quieted. The years 1973 through 1975 saw little publicly reported conflict at Shoreham. Construction at the plant moved along, and to outside observers all was calm. Although the national debate about the costs and benefits of nuclear power continued in the press (*New York Times*, 1976a), nuclear power was still reasonably popular among the public at large. For example, in 1976 voting on a statewide proposal, "Proposition 15," California residents were more than two to one against limiting construction of nuclear plants (*New York Times*, 1976b). LILCO also conducted

polls showing local residents favoring nuclear power, with the level of support declining only slightly from 1975 to 1976 (*New York Times,* 1977a).

Although LILCO and Shoreham appeared to be more than holding their own in the battle for public legitimacy, serious substantive problems were starting to appear at the Shoreham plant. On September 21, 1977, the New York State Public Service Commission announced plans to study how LILCO was managing Shoreham construction. The investigation was prompted by the soaring costs of Shoreham, which had by then surpassed $1 billion. "The plant will probably be the most expensive, in dollars per kilowatt, ever built," noted one observer (*New York Times,* 1977b).

The source of this budget explosion was subject to dispute. A 1977 report suggested that $181 million of the cost overruns was attributable to new regulatory requirements. An August 8, 1978, newspaper column by the project manager of Shoreham linked the rising costs to the "intervention of anti-nuclear 'gadflys' and the continuing growth of regulations" (*New York Times,* 1978). However, a 1977 study carried out by Booz Allen & Hamilton consulting firm showed that the average worker at Shoreham was spending only 20 percent of each seven-hour day performing his or her trade. LILCO management attributed the cost overruns to the "dilatory and antisocial actions" of environmental interests, but several areas of cost appeared to be traceable to "LILCO mismanagement" (*New York Times,* 1979a). By early March 1979, the plant's scheduled date of operation was pushed back to the end of 1980, and its estimated cost rose to $1.3 billion.

On March 28, 1979, the Three Mile Island nuclear facility in Pennsylvania experienced a major nuclear accident. The effect of Three Mile Island on Shoreham would prove to be substantial. The antinuclear movement was again directed against Shoreham, and on June 4, 1979, a massive demonstration took place outside the construction site. Over 15,000 people participated, and over 600 demonstrators were arrested (*New York Times,* 1979b).

LILCO's financial situation was already difficult at this point in the construction of Shoreham. But in April 1979 it worsened, as the New York State Public Service Commission refused to grant the utility a rate increase to cover $400 million spent on Shoreham (*New York Times,* 1979c). Moody's Investor Service also lowered LILCO's rating because of Shoreham.

During 1979, further delays in the construction of Shoreham were announced. Although the 820-megawatt facility was now estimated to be 80 percent completed, new delays moved back the estimated completion date to December 1981. An additional problem LILCO faced was that Nuclear Regulatory Commission (NRC) officials were now so busy working at Three Mile Island that they simply didn't have time to finish their work at Shoreham (*New York Times,* 1979d).

On April 15, 1980, LILCO again pushed back the announced opening of Shoreham, this time by about 20 months, to late 1982 or early 1983. The company also raised the projected cost of the plant from $1.6 billion to $2.2 billion.

One analyst described LILCO as "sort of like a heroin addict," adding

"You have to keep pumping in money." LILCO had been feeding its habit not only by borrowing but also by cutting back on customer service and maintenance (*New York Times*, 1980). As one interviewee stated, "They didn't give a damn about providing service; all they wanted was to build their plant." Critics continued to suggest alternatives such as conservation as a means of meeting Long Island's energy needs.

The End of the Tunnel?

Despite the massive cost overruns, LILCO's tenuous financial situation, and growing popular opposition to nuclear power, the construction of Shoreham continued and indeed neared completion. On May 10, 1981, LILCO's chairman of the board, Charles Pierce, stated, "The end of the tunnel is truly in sight" (*New York Times*, 1981a). However, that same month, Suffolk County began examining its emergency preparedness plan, a plan that had to be in place before Shoreham could begin operations. The plant's proponents said the plan would never be needed. Opponents said it would never work (*New York Times*, 1981b).

A Growing Awareness of Error

The Shoreham budget and completion date were again revised on November 4, 1982. This estimate was $3.1 billion total cost and a September 1983 opening. As noted in the *New York Times* (1983a), the Shoreham plant was conceived when oil was $1.80 a barrel, yet the reactor was supposed to provide even cheaper energy than oil. Now oil was over $30 a barrel, but because of the plant's enormous construction costs, electricity from Shoreham would be three times as expensive as the electricity produced by plants that were oil-burning. "If we had known that we were talking about a $3 billion plant and all the other travail that has gone along the way—the licensing, the political problems—I think we might have chosen not to," said a LILCO spokesman. "It's obviously proven to be the fact that we were overconfident" (*New York Times*, 1983a).

In February 1983, Suffolk County officials asked the NRC to hold hearings because no plan had been approved for the evacuation of local residents in the event of a nuclear accident (*New York Times*, 1983b). This request came against a backdrop of growing local and state resistance to Shoreham. For example, in a debate between LILCO chairman Charles Pierce and the Suffolk County executive, Peter Cohalan, Pierce argued that the evacuation of the area around the plant was feasible and that in any case an accident serious enough to warrant an evacuation would only occur "once in 500 million years." Cohalan stated, "I think they all wish the Shoreham plant to go on line because of their own personal involvement in many years of working with that plant, and also if it were not to go on line, the present management of LILCO might be replaced" (*New York Times*, 1983c).

By late 1983, some consensus had emerged. Many early proponents of Shoreham as well as numerous company officials had come to agree with opponents of the project that it had been a mistake to build the plant. A

typical comment was, "We've got a $3.5 billion white elephant—or at least white to a large extent." Another was, "It doesn't matter whether it runs or doesn't run. Most of what we are doing is damage control" (*New York Times,* 1983d).

On January 31, 1984, Charles Pierce resigned. In reaction to Pierce's resignation, many observers felt that his tough stance had eliminated the possibility of settling the Shoreham issue. One analyst stated, "If they had done this five years ago, it probably would have been a very good move. I think the company had suffered a kind of insularity, where everybody in a top managerial position throughout the whole Shoreham episode had been with the company and only with the company for a very long period of time" (*New York Times,* 1984a). On February 9, 1984, the new CEO of LILCO, William Catacosinos, called the Shoreham plant a mistake and indicated that LILCO was considering abandoning it, although he went on to state that, because of the enormous investment already made in Shoreham, the company's goal was still to open the plant (*New York Times,* 1984b). As one of our interviewees stated, "With Catacosinos it was back to more of a business approach. It wasn't personal. Catacosinos was much more pragmatic."

On February 24, 1984, the company again raised Shoreham's estimated cost and lengthened the time until completion. The plant was now estimated to cost $4.1 billion and was expected to go into operation July 1, 1985 (*New York Times,* 1984c).

Complete but Not Ready

On March 18, 1984, it was announced that the Shoreham plant was complete but that it would take a year or more to begin operations (*New York Times,* 1984d). This time was required for fuel loading and start-up testing. The testing process involved sequences at 0, 5, 10, and 100 percent operation. Each phase required NRC approval.

Although the plant was complete, opposition to its operation had not ended. New York State and Suffolk County still refused to participate in the required emergency planning. However, as 1984 ended, Shoreham reached a crucial point. When a reactor construction project is discontinued, its parts are usually sold as spares or for scrap, with the salvage value running in the $100 million range. In contrast, when a previously operated reactor is shut down, it has no salvage value but instead represents a substantial liability due to the costs of decontamination. Thus, some observers felt that if LILCO began low-power testing, it could create an "inevitability factor." The swing in cost would be at least $200 million.

On January 20, 1985, fuel loading at Shoreham was completed and 1 percent testing was approved. LILCO immediately sought permission to increase testing to the 5 percent level (*New York Times,* 1985a).

On March 31, 1985, it was revealed that despite President Reagan's promise of federal neutrality, the United States Department of Energy had been working behind the scenes to assist in Shoreham's licensing. For example, one internal memorandum stated, "The investment community

needs to see a clear path to final licensing to justify taking the risks of nuclear power" (*New York Times*, 1985b). Another U.S. Department of Energy document stated, "A major concern on Long Island is the ability to evacuate residents. In fact these problems are not real because the risk is so small" (*New York Times*, 1985b).

On June 1, 1985, Suffolk County's Executive Cohalan revised his public position and ordered county employees to participate in the evacuation drill, and LILCO immediately paid the county $131 million in back taxes on the plant. Supporters of Shoreham were ecstatic. Of course there were also broader implications of Shoreham's status for the nuclear power industry in general. As a LILCO vice president stated, "To a great extent, as Shoreham goes, so goes the nuclear industry" (*New York Times*, 1985c).

As Shoreham Goes . . .

On July 8, 1985, a 5 percent operating permit was granted (*New York Times*, 1985d). By mid-November, the 5 percent power testing at the plant was completed, and it seemed that only some major catastrophe could prevent Shoreham from coming on line with full operation. That catastrophe took place at Chernobyl, in the Soviet Union, on April 25, 1986.

One of LILCO's prime arguments for Shoreham was that life-threatening accidents, the kind that did major damage to the surrounding community, were so rare as to be purely hypothetical. After April 25, 1986, that was no longer true. The Chernobyl tragedy provided a major push to Shoreham opponents at a time when their defeat seemed almost certain (*New York Times*, 1986a).

Suffolk County increased its already strong resistance to the project. On June 1, 1986, the county filed a lawsuit charging that LILCO had lied about escalating costs for the Shoreham nuclear power plant and that it had concealed design and construction defects (*New York Times*, 1986b).

By early 1987, it was clear that Shoreham's licensing dispute was fundamentally an issue of states' rights. If the state and local governments refused to participate in evacuation plans, as they did in the case of Shoreham, could the federal government overrule them? It seemed likely the issue would be decided in the United States Supreme Court (*New York Times*, 1987).

The Decision to Close Shoreham

On May 12, 1988, LILCO reached agreement in principle with the state of New York to close Shoreham. LILCO would turn the $5.3 billion plant over to the state in return for rate increases and a $2.5 billion tax write-off (*New York Times*, 1988a). As might be expected, reactions to the proposed transfer were mixed. Some saw the settlement as far too generous to LILCO, and others were concerned about the damage to the U.S. nuclear industry if Shoreham were allowed to be permanently decommissioned. Not surprisingly, many in the New York legislature did not want to be associated with either the closing of the plant or the rate increases required by the pact.

Meanwhile, LILCO moved ahead on a second front, continuing the attempt to obtain licensing for Shoreham. On November 19, 1988, President Reagan issued an executive order under which the Federal Emergency Management Agency could adopt emergency plans if a state or locality refused to participate in such planning efforts (*New York Times,* 1988b). However, LILCO received still another major setback when a federal jury found LILCO guilty of deceiving New York State in obtaining past rate increases. The jury's decision created the possibility of massive class action suits against LILCO. Thus, as 1988 ended there was renewed movement toward licensing, the spector of class action lawsuits, and a shaky agreement with the state for abandonment.

On March 1, 1989, New York's Governor Cuomo reversed his earlier position requiring legislative endorsement of the Shoreham pact. He signed an agreement with LILCO to close the $5.5 billion plant, without even receiving legislative approval (*New York Times,* 1989a). Ironically, on April 20, the NRC finally granted full operating power to the utility. Nevertheless, LILCO's position was that it would honor its earlier agreement with the state.

A Rearguard Action

Throughout both 1989 and 1990, the federal government under President Bush remained dedicated to doing everything possible to keep Shoreham from being dismantled. A U.S. Department of Energy official stated, "We intend to throw up every roadblock we can. And if we have to create some, we'll do so" (*New York Times,* 1989b). In July 1989, for example, the federal government requested the NRC to provide an assessment of the environmental impact of closing Shoreham, knowing that such an assessment could take months or even years to complete (*New York Times,* 1989c). An interest group called "Scientists and Engineers for Secure Energy," including six Nobel laureates, also promised to challenge Shoreham's closing in New York State courts. During these efforts to prevent the dismantling of Shoreham, LILCO was at times a silent observer.

In October 1990, the NRC ruled that "LILCO is legally entitled under the Atomic Energy Act and our regulations to make, without any NRC approval, an irrevocable decision not to operate Shoreham" (*New York Times,* 1990). Not giving up, the Department of Justice filed suit in July 1991, again asking for an environmental review of Shoreham's closing. However, on July 19, 1991, a federal appeals court ruled that Shoreham could be dismantled without conducting an environmental impact study (*New York Times,* 1991a). On August 1, 1991, the U.S. Supreme Court refused to overturn this decision (*New York Times,* 1991b).

Several other lawsuits are still pending, but it now appears that the Shoreham story is finally over. Although some groups still hope for the facility to operate, the steps currently being taken to decommission the plant will be difficult to reverse. And regardless of the plant's future, the basic outline of the history of Shoreham's construction remains clear. A nuclear plant initially estimated to cost $65–75 million ended up costing over $5

billion to complete. Despite an array of negative feedback, LILCO sustained its decision to continue with Shoreham for more than 20 years, a clear-cut case of commitment to a losing course of action.

ESCALATION DETERMINANTS

As we have noted in earlier writing (Staw & Ross, 1987), it is possible to group the determinants of escalation into four broad categories. In the following sections, we will examine how previously identified escalation determinants may apply or need to be revised in the light of the Shoreham experience. We do not attempt to categorize each and every event in the over-20-year history of this multibillion dollar project but instead place the major occurrences into a theoretical framework.

Project Determinants

Certainly a major group of determinants for the Shoreham nuclear plant involved objective features of the project itself. Five project variables we examined were the ambiguity of economic data, the sequencing of the projects' costs and benefits, the categorization of Shoreham as a long-term investment, the salvage value and closing costs for Shoreham, and finally, the overall size of the project. We consider each project determinant briefly below.

First, assessing the economic prospects for Shoreham involved the simultaneous estimate of many completely exogenous variables decades into the future. These included the price and availability of oil, the price and availability of alternative energy sources, such as coal, the long-term energy demand on Long Island, the cost of capital, the operating capacity and life of an 800-megawatt nuclear plant (the first in existence), and the cost of coping with changing governmental regulations and external pressure groups. Estimates on these many economic components fluctuated widely over the entire life of the project among both the supporters and the opponents of Shoreham as well as among neutral observers of the situation. Unfortunately, as Northcraft and Neale (1986) showed, clear and salient financial information may be necessary for decision makers to withdraw from a losing course of action. Thus, not being able to estimate Shoreham's costs and benefits within normal ranges of confidence probably made it difficult for policy makers to draw a firm line for withdrawal.

The sequencing of rewards and costs may also have acted against withdrawal from the course of action. As can be seen from Table 1, the cost estimates for Shoreham rose almost exponentially. However, although costs continually increased, the dollar value of each increase was a relatively small percentage of previous expenditures. In addition, most of the expenditures took place when the plant was already 80 percent completed, with a large percentage of subsequent costs the result of responses to governmental regulations and delays in operational licensing. Recent research on the effects of sunk costs (Arkes & Blumer, 1985; Garland, 1990) suggests that

having a nearly complete physical structure probably increased the willingness of LILCO to invest additional funds.

The initial categorization of Shoreham as a long-term investment probably also affected how feedback on the project was interpreted. As we have noted (Staw & Ross, 1987), with long-term investments initial losses are accepted as the price of subsequent returns. In the case of Shoreham, even the most enthusiastic backers of the nuclear plant felt that the payback period might be ten years from the date of completion. Therefore, when construction costs rose and the completion date receded, the impact on proponents in terms of monitoring vigilance or thoughts of discontinuance was probably less than would have been the case with a shorter-term endeavor.

Following Northcraft and Wolf (1984), we should also note that salvage value and closing costs may have influenced Shoreham's construction. The salvage or conversion value of Shoreham was never very high, the most positive pre-1985 estimate being in the $10–100 million range. However, after the plant underwent its 5 percent testing, not only was there no salvage value, but a very high cost of decommissioning the facility was incurred. Testing raised the costs of withdrawal at least $200 million: $70 million for the partially used fuel itself and the remainder for decontamination.

A final but perhaps compelling factor in the decision to persist with Shoreham was the project's sheer size. As a greater and greater percentage of LILCO's assets were tied to Shoreham, the facility and the future of the utility became intertwined. The project turned into a "bet-the-company" proposition. By 1984, it was clear that the facility faced tremendous roadblocks to ever opening and should probably be abandoned. Yet, as a LILCO spokesperson said in one of our interviews, "To abandon was to declare bankruptcy, and the new leadership of the organization was unwilling to do that."

Psychological Determinants

As Platt (1973) and March (1978) argued, those who have advanced to top leadership positions may be prone to reinforcement traps, situations in which people assume, because of their histories of success, that losing courses of action will turn around. The leaders of LILCO probably were no exceptions. LILCO's head, Charles Pierce, for example, joined LILCO's legal department in 1949, rose steadily through the corporation's ranks, became secretary in 1962, vice president in 1966, senior vice president in 1969, president in 1974, and chairman in 1978. With such a personal reinforcement history, it may have been difficult for him to conceive of a course of action not eventually being successful.

A second set of psychological factors that may have influenced escalation at Shoreham were errors in information processing. As Nisbett and Ross (1980) summarized, people have an almost uncanny ability to bias facts in the direction of previously accepted beliefs and preferences. In a similar manner, LILCO decision makers' estimates of the future demand for energy and the possibility of energy blackouts were vastly overstated; their esti-

mates of the cost and completion date for Shoreham were invariably optimistic; and their estimates of the benefits of Shoreham were greater than those provided by observers in virtually every case. In our interviews, officials of the firm admitted that, in retrospect, they had been far too confident.

A related information-processing error was failing to properly isolate the causes of failure for the Shoreham decision. Individuals' responses to negative feedback can depend on whether they believe endogenous or exogenous factors have caused a setback (Staw & Ross, 1978). And, as research on self-serving biases has repeatedly documented, people are much more likely to attribute negative outcomes to external than to internal causes (e.g., Miller & Ross, 1975; Nisbett & Ross, 1980; Staw, McKechnie, & Puffer, 1983). In the Shoreham case, there is much evidence to suggest that decision makers saw the failing decision not so much a product of their own faulty calculus or lack of management as the result of intervention by external regulators and "anti-social elements." This was a recurring theme in LILCO's advertising and in public statements by company officials. Thus, the impact of negative feedback coupled with its attribution to illegitimate external sources may have impeded decision makers' objective examination of Shoreham's prospects and reduced the likelihood of withdrawal.

Social Determinants

Social determinants associated with escalation were also present in the Shoreham case. Two closely related factors were external justification and social binding.

External justification involves the need for decision makers to rationalize their actions to other parties. As Fox and Staw (1979) showed, external justification effects are particularly strong among those who are politically vulnerable or whose initial policy choice has met with resistance. In constructing Shoreham, LILCO's management continually faced the need to assure external constituencies, such as shareholders and the public utilities commission, that its investment was a wise one. Indeed, some estimates provided by LILCO were so wide of the mark that the utility found itself indicted for fraud by Suffolk County and New York State authorities. It seemed that as the management of LILCO's commitment to Shoreham was challenged, each challenge was met with renewed justification, only serving to further increase commitment to Shoreham.

LILCO's management may also have become increasingly committed as it became personally identified with Shoreham. As Salancik (1977) noted in his theory of commitment, the binding of decision makers to a course of action is especially likely to occur when advocacy is public, explicit, high in volition, and repeated. Interestingly, all these conditions were present in the Shoreham situation. For example, LILCO's chairman repeatedly spoke out in favor of the project, not only acting as company representative in routine functions, but also personally appearing in many of LILCO's advertisements promoting the plant. In a sense, the executives linked to Shoreham had staked both their jobs and their reputations on continuation of the project.

Two additional social variables that may have contributed to persistance in the Shoreham case were norms of consistency and modeling.

Norms of consistency have been shown to influence how leaders are evaluated (Staw & Ross, 1980). American society reserves special praise and admiration for those who stay a course in the fact of hardship, only to triumph in the end. The idea of consistent leadership was a recurrent theme and promised source of vindication in LILCO's pronouncements. Even as late as 1982, LILCO officials stated, "If people will just wait until the end, they are going to realize that this is a hell of an investment."

Modeling may also have been influential in the Shoreham case. Since the complexities of plant construction prevented reliance on objective analysis, officials at Shoreham seemed to rely on socially derived information (Brockner et al., 1984). LILCO was one of the few major utilities in the United States not to have a nuclear power component. And a repeated source of annoyance to LILCO officials was the fact that other nuclear facilities, conceived and begun at the same time as Shoreham, were rapidly constructed and operating successfully. In fact, there had never been a single instance of the AEC or NRC refusing to license a plant once it was constructed. These social comparisons likely increased the confidence of LILCO management that, eventually, Shoreham would be allowed to begin operation.

Organizational Determinants

In addition to the project, psychological, and social variables considered here, several organizational determinants also appeared to contribute to LILCO's continuing the Shoreham project. We consider in particular the role of technical side-bets, political support, and institutionalization.

The decision to embark on the construction of a nuclear power plant involved far more of an investment than simply the plant construction itself. It involved hiring planners, operators, a technical support staff, and a variety of other people, all of whose primary asset was expertise with nuclear power. The presence of these individuals tended to both frame the way new information was viewed and constrain the options considered. Increasingly, the company placed all its hopes in the nuclear basket, forgoing routine maintenance on existing facilities, such as tree trimming or moving power lines underground, so that more funds would be available to invest in Shoreham. LILCO ignored conventional power plants with known costs and benefits and instead plowed more money into Shoreham. Over time, LILCO wasn't merely investing in Shoreham as a part of its energy program: Shoreham was LILCO's energy program.

Originally LILCO had planned to build not one but several nuclear power plants on Long Island. The aim was to capitalize on the organization's access to the massive water cooling supplies of the Atlantic Ocean and to become a major energy wholesaler. When local resistance mounted and the company suffered defeats in Lloyd Harbor and Jamesport, only Shoreham remained of what one of our interviewees called "LILCO's sense of manifest destiny in energy production." Thus, the linkage of Shoreham to LILCO's

strategic corporate vision likely contributed to the utility's difficulty in abandoning the nuclear plant.

Contextual Determinants

Though contextual determinants were not an explicit part of our a priori model, Shoreham illustrated their importance. In the Shoreham case, the decision to construct a nuclear plant became larger than the organization itself, involving forces beyond the organization's boundaries. In addition to the nuclear power constituency created inside LILCO, a range of external political parties influenced Shoreham. These included other public utilities interested in nuclear power, representatives of the nuclear power industry, and those in the federal government pushing for the development of nuclear power. The role of these external parties and their alliances with LILCO cannot be overemphasized. Grossman noted, "Of all the U.S. utilities, none has had closer ties with this [nuclear] establishment than LILCO. LILCO's location was in the middle of the area where the U.S. government, after the war, set up a key facility to develop nonmilitary uses of nuclear technology—Brookhaven National Laboratory" (1986: 167). LILCO wedded itself to this nuclear establishment as it sought to overcome resistance to the completion and operation of Shoreham. It is worth noting that even as late as 1990, these external forces continued to push for Shoreham's operation, although LILCO itself had agreed to abandon the facility. Both the Department of Energy and various citizens' lobbying groups were still engaged in a variety of actions to prevent Shoreham's decommissioning. In effect, these groups could be seen as attempting to convert LILCO into a "permanently failing organization" (Meyer & Zucker, 1989). From the perspective of these external groups, persistence with Shoreham was far more of a concern than LILCO's performance.

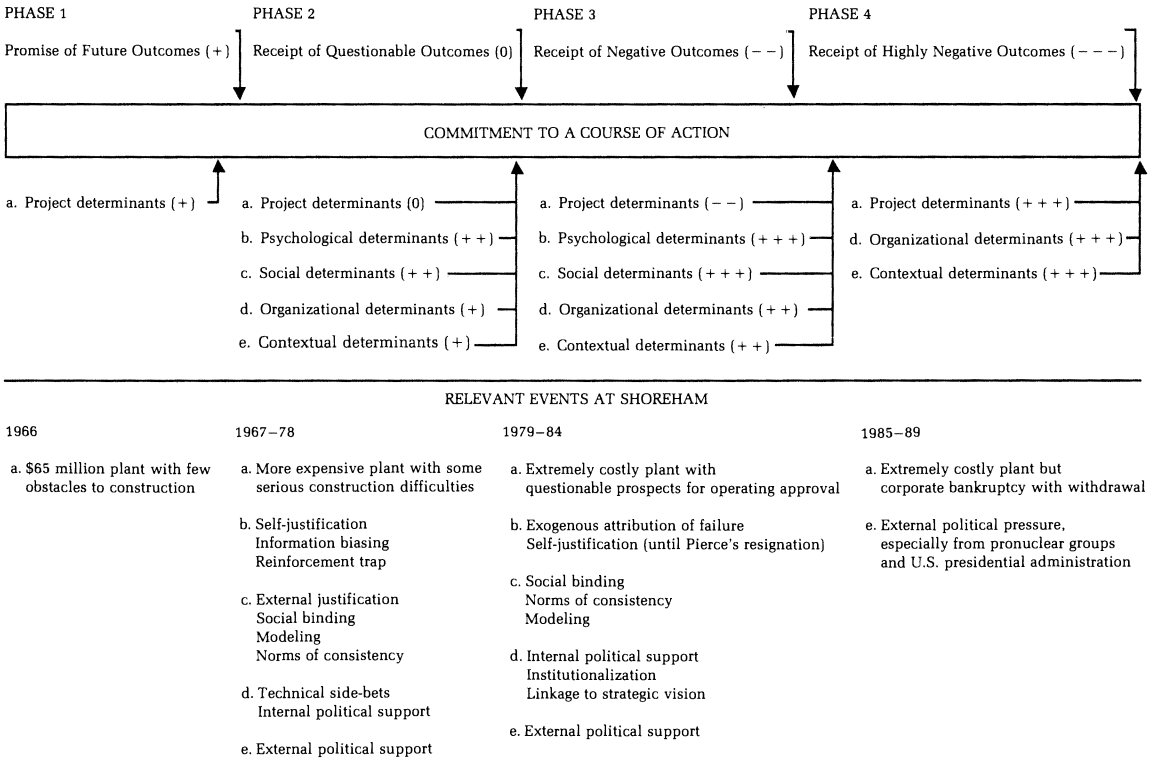
A Summary Model of the Shoreham Decision

Figure 2 summarizes the most important influences in the Shoreham case.

When LILCO first decided to build the Shoreham plant, in 1966, project variables appeared quite favorable. Future nuclear fuel costs promised to be much lower than those of oil and, as proponents of the plant pointed out, there had never been a serious nuclear accident. Therefore, as with other projects at their inception, commitment was at first driven by what seemed to be objectively positive economic criteria.

The second stage of the Shoreham project (1967–78) involved the many years in which public hearings were held to obtain a construction permit as well as the start of construction itself. During this period, the project variables grew somewhat less positive, as delays and changes in design increased the project's cost, with the result being that the relative advantage of Shoreham over other sources of energy declined. However, any decreases in the attractiveness of the project were probably more than offset by increases in psychological and social sources of commitment. As noted, LILCO's man-

FIGURE 2
Stages of the Escalation at Shoreham[a]



[a] The pluses, zeros, and minuses represent our evaluation of how much and in what direction each of the various determinants contributed to commitment to the course of action. Though these values are approximations, they are intended to indicate how each determinant's strength tends to vary over time.

agement tended to bias the information about Shoreham in a positive direction and to otherwise justify their previous decisions on the project. In addition, repeated demands to defend the project with various external constituents, such as stockholders, utility commissions, and licensing agencies, may have also contributed to commitment on the part of LILCO's management to Shoreham. By the end of 1978, negative news about the economics of the project had steadily accumulated, but there was still sufficient ambiguity about its value and strong enough countervailing forces for LILCO to maintain commitment to the course of action.

A major difference between the Shoreham case and previous research and theory on organizational escalation was the early buildup of organizational and contextual influences. As noted earlier, Expo 86 was initially designed to be a self-terminating and relatively small-scale event organized by the province of British Columbia. Expo obviously grew in importance over time and, because of its escalation, came to be a central problem of the provincial government. Unlike Expo, however, Shoreham did not start as a small pilot project viewed by LILCO as peripheral or transitory. From the outset, Shoreham constituted a strategic effort to convert LILCO from a conventional utility to a more forward-looking high-technology enterprise. In addition, by building and seeking to operate a nuclear plant, LILCO hired a personnel vastly different from that needed to run coal- or oil-fired facilities. Once at LILCO, these specialized staff members not only constituted a major technological side-bet or sunk cost, because they could not easily be reassigned to other projects, but they also formed—along with those who hired them—a powerful political constituency within the company. At the same time as these internal forces for continuing Shoreham were building within LILCO, the company was also building alliances with external interest groups favoring nuclear power. Thus, organizational and contextual sources of commitment were both more evident and earlier occurring in the Shoreham case (shown in phase 2) than in previous research on escalation.

A third phase of Shoreham can be identified as occurring during the early 1980s. As Figure 2 shows, project variables turned distinctly negative at this time. However, although outside observers repeatedly called for the project's abandonment, LILCO's management still tried to defend the plant as a good investment. No doubt psychological and social variables served as a foundation for those optimistic forecasts, at least up until Charles Pierce's resignation in 1984. After Pierce's resignation, attempts to justify the original merits of the project diminished drastically. Instead, as the third phase of Shoreham ended, LILCO's commitment was defended as a way to recoup the billions of dollars of prior expenditure. To abandon Shoreham was tantamount to declaring bankruptcy, and LILCO's new leadership was unwilling to do that.

By the fourth phase of the Shoreham case (1985–89), the earlier psychological and social influences on commitment had been largely removed. However, at the same time, economic forces again started favoring continuation, as a grim reality became clear: either the plant would become opera-

tional or the company would collapse. In a manner reminiscent of the earlier Expo case (Ross & Staw, 1986), project variables had once again become a positive binding force late in the escalation cycle. In addition, contextual forces favoring continuation of Shoreham strengthened further. Pressure on LILCO from interested parties favoring continuation, ranging from the pronuclear lobby to the U.S. Department of Energy, mounted. However, unlike Expo, Shoreham had no fixed date for project termination. As a result, LILCO started to assume some of the features of a permanently failing organization (Meyer & Zucker, 1989), limping along to satisfy powerful internal and external constituencies.

CONCLUSIONS

Fit With the A Priori Model

Much like the Expo case, the Shoreham experience would seem to illustrate what we have earlier called an escalation prototype. As Table 1 and Figure 2 summarize, from 1966 until 1989 the Long Island Lighting Company's investment in the Shoreham Nuclear Power Plant rose from $65 million to over $5 billion. No one would have recommended construction if the original projected cost had been $5 billion. Yet, over this 23-year period the company continued to increase its commitment and did so despite a steady flow of negative feedback. Thus, construction of the Shoreham nuclear plant provides a rather graphic example of organizational escalation.

Though the Shoreham case does not fit perfectly the a priori model, many of the same principles of escalation can be deduced from Figure 2 and the earlier model. First, it appears that negative results are more likely to be influential if they are clear-cut and come early in the escalation cycle. However, in the Shoreham case, as in other typical escalation episodes, results are either initially positive or ambiguous enough to delay judgment. And, by the time it is obvious that things have gone awry, other sources of commitment may have grown strong enough to hold an organization in its course of action. As noted, psychological, social, organizational, and even contextual forces built early in the Shoreham case, offsetting negative economic data. Later in the escalation cycle, even project variables became a salient source of commitment. Thus, the Shoreham case provides a clear-cut example of how difficult it is for economic results alone to prompt withdrawal from a losing course of action.

On a general level, the Shoreham experience appears to validate our first proposition, which predicts that a combination of psychological, project, social, and organizational determinants will determine organizational escalation. There also appeared to be partial support for our second proposition, which describes a temporal ordering of escalation determinants. As predicted, psychological and social variables were important at the beginning and middle phases of the escalation episode but did not appear influential at the final stage. Also as predicted, project variables were an important force for commitment at both the earliest and latest stages of the episode. How-

ever, in a manner neither our second proposition nor the a priori model in Figure 1 predicted, organizational determinants of escalation appeared as an early influence on Shoreham. Nuclear power became an important part of LILCO's long-term strategy and corporate identity at a relatively early phase of the episode. Moreover, contextual influences became a very powerful force in the Shoreham case in ways the a priori model did not anticipate. In the end, LILCO appeared at times to be almost a neutral observer, while external forces for and against Shoreham determined the fate of the nuclear plant.

Some New Propositions on Escalation

Several new propositions can be gleaned from the Shoreham case. First, we can predict not only that organizational determinants may come early in an escalation episode, but also that their early arrival increases the likelihood of a lengthy cycle of escalation. Thus,

> *Proposition 3: The earlier organizational determinants occur in an escalation episode, the more likely there will be long-term commitment to a course of action.*

Similiarly, it can be argued that when external constituencies become substantially involved in an escalation episode, the focal organization can actually lose control of the project it initiated. Contextual forces can turn the decision to stay or withdraw into a political rather than an economic or even organizational issue. Thus,

> *Proposition 4: The more external political forces become aligned with a project, the more difficult it will be for the initiating organization to withdraw from the course of action.*

The particular project variables in the Shoreham case suggest two additional propositions. In the typical escalation episode, results are initially positive but turn distinctly negative as the episode continues over time. In the Shoreham case, even after the plant's construction costs had greatly inflated, it was still possible to estimate a net benefit, given sufficiently high estimates of long-run oil prices. Thus, project economics remained ambiguous for long enough for other variables (psychological, social, and organizational forces) to take hold as major determinants of commitment. Hence,

> *Proposition 5: The more ambiguous and changing the economics of a project, the more difficult it will be for an organization to extricate itself from the selected course of action.*

Another project consideration with Shoreham was the sheer size of the venture relative to the total size of the firm. There seemed to be a crucial turning point in the Shoreham case when the nuclear plant moved from being a serious endeavor to a bet-the-company proposition. In fact, the point at which potential losses became so large that withdrawal was tantamount to

bankruptcy may have coincided with the time when project variables turned into a powerful late-stage influence on escalation. Thus,

> *Proposition 6: When the potential losses of a project become so large that withdrawal might lead to bankruptcy, an organization becomes increasingly committed to the losing endeavor.*

As in the Expo case, one of the factors that seemed to influence Shoreham was a simple sunk costs effect (Arkes & Blumer, 1985; Garland, 1990), in which LILCO executives were unwilling to accept the fact that prior expenditures of resources may have served no purpose. In contrast, in research by Garland, Sandefur, and Rogers (1990), experienced oil industry managers seemed to be immune from the sunk costs effects often shown when business students and other laboratory subjects are studied. Perhaps those who work in occupations in which escalation is a routine problem may be socialized to avoid excess persistence; for instance, in the oil industry managers must often decide when to give up on drilling for oil in a dry hole. Likewise, organizations in which escalation is frequent may develop structural mechanisms, such as bank "work-out groups" (units whose sole function is to deal with nonperforming loans), to check escalation tendencies. On the other hand, when high-level executives pursue a major new initiative or a one-time activity like hosting a world's fair (Ross & Staw, 1986), they may not have the benefit of prior experience with similar losing courses of action, and as a result they may not be very adept at avoiding the trap of escalation (Ross & Staw, 1991). Interestingly, Shoreham was just such a new venture for LILCO, one for which prior learning was unavailable or seemingly inappropriate to the situation. Thus,

> *Proposition 7: Escalation problems are especially likely to occur when managers venture far from their areas of expertise or when technological changes cause such major changes in an organizational context that previously learned procedures and decision checks are no longer applicable.*

Organizational Exit

As we noted at the outset of this article, prior research provided few theoretical leads about the exit of organizations from losing courses of action. Escalation research generally stops at the point at which an organization is still locked in a losing situation (see Simonson and Staw [1992] for a recent exception at the individual level of analysis). Of course, we have earlier posited that the exit of top executives, especially those associated with the origination of a project, can reduce psychological and social forces for commitment, thus making withdrawal more likely (Staw & Ross, 1987). We also noted that it may be possible for an organization to withdraw from a late-stage escalation episode by deinstitutionalizing a project—by separat-

ing it from the major goals and purposes of the organization, isolating it physically from the rest of the firm, or raising other activities to a more central position. Still, the emphasis of escalation research has been on understanding increases rather than decreases in commitment.

The typical assumption in the escalation literature is that organizations must choose between withdrawal from a losing project and remaining in the course of action, perhaps until bankruptcy or organizational death occurs. However, there is a middle ground between those extremes. As Meyer and Zucker (1989) noted, it is sometimes possible for an entity to become a permanently failing organization, continuing to survive in a negative situation, perhaps by absorbing resources from third parties or somehow generating enough revenue to offset continuing losses. Survival in such a negative state is possible to the extent that the organization has substantial reserves of capital and legitimacy; for example, General Motors' ability to absorb a long string of losses in the 1980s without substantial change. It is also possible for various constituents in its environment to prevent an organization from failing. In the Shoreham case, the U.S. Department of Energy worked hard to keep the nuclear plant alive because of its significance for national policy on nuclear power.

Therefore, we might hypothesize that, when there is not ready replacement for the services or products of an organization, external parties, including government, business, and consumer interests groups, will attempt to prevent the organization's withdrawal.

> *Proposition 8: When external constituents are successful in preventing the closing of a losing project or service, the unsuccessful firm or department may become a permanently failing organization.*

In the Shoreham case, the executives of LILCO did not succumb to bankruptcy or let their firm become such a permanently failing organization. Nor did they make a simple exit from the nuclear plant via executive turnover or deinstitutionalization of the project, perhaps because the losses would have been too enormous to allow the company to survive. Instead, LILCO extricated itself from Shoreham with help from third parties. LILCO did this, not by surrendering to the influence of external constituencies, but by carefully managing them.

Although LILCO frequently marshaled support for Shoreham from external parties like the nuclear power industry and the U.S. Department of Energy, it managed to avoid becoming so indebted to or controlled by these external allies that it could not walk away from the embattled facility. At the same time, LILCO overcame the opponents of Shoreham by remaining steadfast in its commitment to the losing project. Almost as if playing a high-stakes game of chicken, LILCO convinced external opponents that it would pursue Shoreham to the bitter end, even if it meant the possible ultimate ruin of the utility. In a sense, LILCO conveyed to its protagonists that it had no

viable options or means to move away from the Shoreham project, somewhat like the car driver displaying a severed steering wheel to his approaching adversary described by Schelling (1960). In the end, by keeping its commitment to Shoreham, LILCO convinced such external parties as the state of New York, the Public Service Commission, and Suffolk County to alter the economics of the situation. The state's offer to buy Shoreham in exchange for tax write-offs and future rate increases drastically changed the project economics for LILCO, making it finally possible to close the nuclear plant.

Was Shoreham's management of external constituencies to the point of negotiated withdrawal an exceptional case, one perhaps possible only for a public utility? We think not. Any enterprise with products or processes that affect the public welfare has the potential to receive a public bailout, as the cases of Lockheed Aircraft Corporation, with its large defense business, Chrysler Corporation, with its large employment base, and the recent savings and loan debacle demonstrate. Thus, if an organization is large enough and the consequences of persistence in a losing course of action are dire enough, there is room for the organization to negotiate with external constituencies. If public assistance is unavailable, additional loans or credits may be possible if other parties, such as banks, are tied deeply enough to the survival of the failing enterprise. Finally, if the organization supplies products that are essential for the operation of other firms, and especially if it is a sole or near-sole supplier, downstream customers may come to its aid.

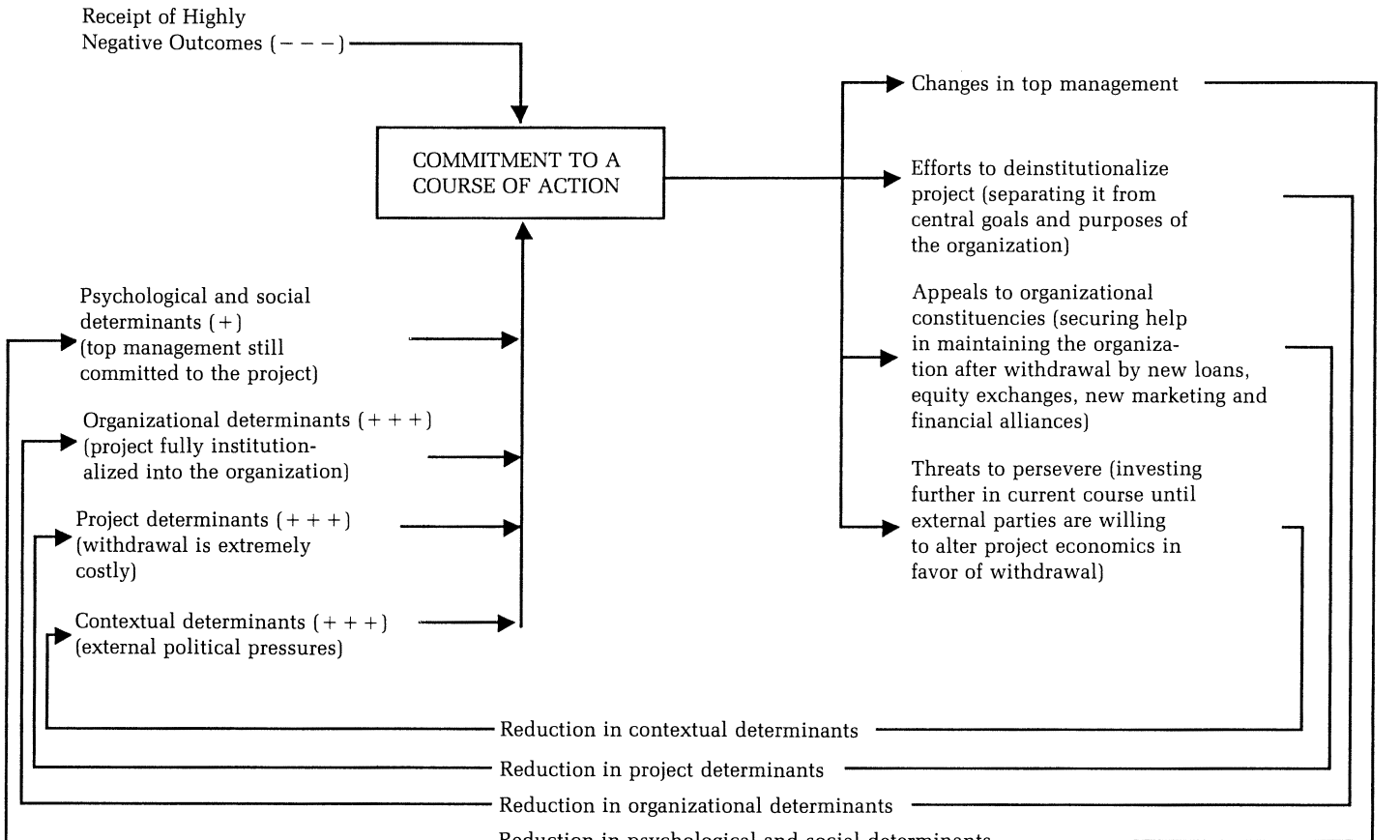
Figure 3 illustrates the lessons of Shoreham for organizational exit. The figure begins with the depiction of commitment to a late-stage escalation episode and likely levels of psychological, social, project, organizational, and contextual sources of commitment. The figure outlines what we now believe are four common strategies of extrication from such late-stage escalation episodes and shows the theoretical mechanisms by which these forms of exit may operate.

The most obvious means of exit, according to previous escalation studies, is a change in top management. For example, when William Catacosinos replaced Charles Pierce as CEO of LILCO, concerned parties both inside and outside the company perceived that deescalation of commitment was more likely than it had been before. As one report said, "The managers [at LILCO] who have devoted several years of their careers to preparing the plant for operation [sat] stone-faced as Mr. Catacosinos [said], 'I want this plant to open, but I'm not married to it. I don't have the emotional attachment to it that you guys do' " (*Wall Street Journal*: 1984b). Thus,

> *Proposition 9: Changes in top management can reduce psychological and social sources of commitment, thus increasing the propensity for withdrawal from a losing course of action.*

As we originally noted (Staw & Ross, 1987), exit may also be facilitated when an organization deinstitutionalizes a project, removing it from the core of the firm either by moving it physically away from the central location of

FIGURE 3
Organizational Exit from a Late-Stage Escalation Episode



the company or by emphasizing its peripheral nature. For example, corporate spin-offs of troubled divisions are now common, as are assignments by financial institutions of questionable assets, usually troubled loans, to associated but independently owned "bad banks." Alternatively, by labeling a project as an experimental endeavor, and perhaps as one in which failure is not unexpected, an organization can foster deescalation of commitment. As Campbell (1969) noted, an important principle of managing bureaucracies may be promoting commitment to general problems, while at the same time ensuring that commitment to specific programs is kept in check. Thus,

> *Proposition 10: Efforts to deinstitutionalize a project, or to separate it from the central goals and purposes of an enterprise, can reduce organizational determinants of commitment, thereby increasing the propensity for withdrawal.*

Finally, as the Shoreham case demonstrates, it may also be possible for an organization to exit from a losing course of action by appealing to various constituencies to change the economics of a project. This can be done by getting financial help from employees, via the suspension of work rules or pay increases, for instance; from stockholders, by suspending dividends or exchanging debt for equity; from supplier firms, via generous payment terms for merchandise; or from financial backers, by debt restructuring. Somewhat paradoxically, as shown in the Shoreham case, external parties may also come to the rescue of a declining organization via threats to persevere in the losing course of action. Thus,

> *Proposition 11: Appeals to favoring organizational constituencies (for new loans and support) can change a project's economics so that withdrawal is not so costly and thus more likely to be chosen as an alternative.*
>
> *Proposition 12: Threats to persevere in a losing course of action can influence opposing constituencies to change a project's economics, thus making it less costly (and more likely) for withdrawal to occur.*

These propositions on organizational exit can be viewed as a logical extension of the temporal model of escalation, helping to specify what happens at the latter stages of a costly cycle of escalation. Obviously, many of these propositions are speculative. Although the Shoreham case provides some long-needed data on how organizations cope with and finally extricate themselves from costly courses of action, the propositions based on this case need additional verification.

As the Shoreham case illustrates, much more research is needed to explain the dynamics of both escalation and exit. We believe it is essential that this research be both multilevel and multimethod. A variety of approaches, drawing on experimental, archival, questionnaire, and case study data, can contribute to this pursuit. We should remember, however, that if

the goal is to understand organizational escalation, greater attempts must be made to lodge the research within organizational contexts. Only by conducting contextually based research can observers fully understand how organizations are drawn into losing courses of action and how they may be able to extricate themselves from these predicaments.

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