

Special Report



Post-project appraisals pay

Frank R. Gulliver

If your company is like most, you spend thousands of hours planning an investment, millions of dollars implementing it—and nothing evaluating and learning from it. As a result, you may not have answers for the most basic questions: Was the investment successful? What made it go according to plan? Did it go according to plan at all? As easy as these questions seem, the answers aren't always obvious.

British Petroleum (BP) built a plant in Australia to convert gas into a component of high-octane gasoline. It came in under budget and ahead of schedule. A similar facility in Rotterdam went over budget and was a year late. BP's managers first drew the obvious conclusion: the Australian plant was a success and the Dutch one a failure. But a second look challenged that first impression.

At the time the Australian project was proposed, that country was suffering from a balance of payments deficit, and the product was expected to help the country reduce its gasoline imports. The plant was completed earlier than expected. But by that time, Australia's economic situation had changed, and gasoline demand turned out to be lower than predicted.

Mr. Gulliver is group internal auditor with the British Petroleum Company. He was a founding member of its post-project appraisal unit, and it remains part of his responsibility today.

Although the Rotterdam project had obvious problems, the market for the product remained strong in Europe. Thus that project's return on investment was in line with predictions, while that of its Australian counterpart was much lower. The Rotterdam project's success taught top managers at BP a valuable lesson: the planners needed to improve their market forecasting techniques.

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There is an independent unit at British Petroleum's London headquarters responsible for identifying these kinds of issues—the post-project appraisal unit (PPA). It examines the thinking behind selected investments as well as their management and their results. PPA's sole mission is to help British Petroleum worldwide learn from its mistakes and repeat its successes.

Since its inception at the end of 1977, PPA has appraised more than

80 of BP's worldwide investments, including onshore and offshore construction projects, acquisitions, divestments, project cancellations, research projects, diversification plans, and shipping activities. The appraisals are not academic exercises; the unit seeks to improve company performance.

Through PPA, BP managers have learned how to formulate investment proposals more accurately, approve them more objectively, and execute them more efficiently than ever before. As a result, most projects now generate returns on investment at least as high as those forecast. These improvements have naturally boosted the company's overall financial performance: in 1985, BP's profits reached an all-time high of £1,598 million after taxes. While PPA isn't the only reason for this performance, managers at BP believe the appraisal unit has yielded dramatic results.

Wide-angle inquiry

In talking with businesspeople from large British and multinational corporations, I have found that few companies examine their completed projects in any depth. Most audits are narrowly focused attempts to check that proper controls are in place while a project is in operation. When our managers audit an oil refinery, for example, they gather detailed information about how the oil and gas is collected, measured, shipped, and accounted for.

A post-project appraisal, however, takes a much larger view. It first looks at the big questions: Why was the project started in the first place? Is it producing as much oil as the proposal predicted? Is the demand for oil at the forecasted level? Did the contractors deliver what they promised? Does the project fit well into BP's overall corporate strategy?

In "post-completion reviews," some U.S. corporations attempt a similar sort of wide-angle evaluation of past projects. But these differ from BP's post-project appraisals in two ways: objectivity and applicability. Because project members usually conduct post-completion reviews, they are more likely to have preconceived ideas

or even a vested interest in the reviews' outcomes. The members of BP's PPA unit have no affiliation with the projects they appraise and so can evaluate investments more objectively.

Moreover, post-completion reviews usually don't guarantee that the lessons will reach the people who need them most, because the information spreads by word of mouth. PPA, in contrast, is a centralized department that can inspect any type of investment in any part of the far-flung BP group and transmit information from one site to another. It can learn lessons from an oil refinery project in France and teach them to planners working on a similar plant in Australia.

PPA is also part of BP's investment proposal procedure. The unit reviews all new investment proposals to make sure that no one repeats mistakes. When they have time, unit members will even work with project planners to formulate proposals.

Appraisal operations

The PPA unit consists of a manager and four assistants, reporting directly to BP's board of directors. In the unit's nine-year history, the composition of the staff has, of course, changed a few times. PPA managers, however, have to meet the same criteria: they must be acceptable to the most senior echelons of management and must have at least 15 years of broad-based experience at BP. The company chooses the other staff members for their specific expertise. They might be engineers, chemists, physicists, economists, or accountants. A team of two or three unit members investigates each project.

An appraisal of a large investment generally takes about six months to complete. Because the company can absorb only so much information at a time, the unit limits its major appraisals to six per year. The most valuable lessons come from the largest projects, where BP stands to lose or gain the most money. PPA selects its projects carefully, looking for those that will yield the most valuable results.

The unit does not therefore investigate a project if its lessons will duplicate those drawn from a previous appraisal. Nor does it evaluate a project

that BP is unlikely to do again. The unit once considered appraising a large crude-oil sale contract that BP had made with another big oil company. Because the Middle Eastern nations had nationalized their oil fields, however, BP no longer made such sales. The unit consequently decided not to study the project.

Getting started. BP is divided into 11 businesses, each with its own board of directors and chief executive. These businesses report to BP's central management, which is headed by the main board of directors. A corporate review committee of BP's main board must approve each PPA appraisal. This committee both oversees the unit's activities and examines all proposed capital investments for compatibility with BP's corporate strategy. PPA submits proposals for projects it could appraise in 18 months to two years, and the committee generally accepts them, though it occasionally adds or deletes one or two.

The unit staff then determines the order in which to carry out the appraisals and, with the chief executive of the project's business, sets a broad timetable for each investigation.

A PPA team examines a project from its conception—before the proposal is even written—usually until two years after it has become operational. The team tries to determine systematically how a project was handled: at the proposal stage; during the project's construction (or, in the case of an acquisition, during the target company's purchase); during the project's operation (or the acquired company's integration into BP); and during the post-operation (or post-integration) stage. PPA always tries to determine the important factors that contribute to a project's problems or success.

Although it usually learns more by seeing how problems developed, the unit also finds it useful to pinpoint the causes of success. The purchase of a Dutch nutrition company called Hendrix, top management agreed, was one of the smoothest acquisitions ever. PPA ascribed its success largely to the precision with which the planners had determined the extent of Hendrix's integration into BP.

Files and interviews. At an appraisal's outset, the team relies on

the files to become familiar with the project. This avoids wasting people's time. The team learns about the economic climate at the time, the identity of the contractors, or the chemical process used. Team members might spend the first two months of a six-month investigation just looking at files—both at project files and at material in related corporate files, in such departments as accounting, legal, or planning.



While the PPA manager will probably already know the senior managers who should be interviewed, the files provide a complete list. The team generally tries to interview everyone involved in the project. Since most projects have been completed for at least two years before the unit begins its work, however, the project members are working all over the world on other things. In one investigation, the PPA team talked to 80 individuals; the average is usually around 40.

In their interviews, the PPA team members make an effort to understand the psychology of the project members and managers. They interview in pairs so that one team member can ask questions while the other watches the interviewee. A furtive look often tells as much as a direct answer.

After the interview, the two team members compare notes and reconcile differences in their perceptions. The full story usually emerges in separate pieces: senior managers in London will give up one piece of information; engineers on an oil rig in the middle of the North Sea will give up another. By melding project members' different perspectives, the PPA people can come up with the whole picture.

PPA team members realize that project employees shed light on is-

Four lessons

Over the past ten years, PPA has taught BP management four main lessons. These are:

Determine costs accurately

Before PPA existed, BP's management approved unrealistically low budgets because planners inaccurately predicted the scope of the project when they submitted the budget. Now BP approves budgets in phases, and each phase becomes more accurate as planners work out the project's details.

In the first phase, the engineers offer an approximate figure for the project's budget that could be off by as much as 50%. The board then approves about 1% of this sum to pay outside engineers and consultants to develop the case more fully. The engineers then submit a more accurate budget. Eventually, at the time the board approves the entire project, it adopts a final budget, which should be off by no more than 10%.

BP now pays more attention to the technical requirements of local health, safety, and environmental legislation. Company managers look beyond simply what the legislation requires; to estimate costs accurately, BP planners solve any design problems created by such regulations in the proposal stage.

Managers now are careful not to rush a project's approval so it can qualify for a government grant or other bonus. A rushed project is often inadequately defined and therefore out of control from the start, runs very late, and comes in over budget—so much over budget that costs substantially exceed the incentive.

The corporation no longer automatically awards a contract to the lowest bidder. Many low bids come in because contractors don't fully understand what BP needs. PPA has found a correlation between low bids and poor contractor performance.

Anticipate and minimize risk

Fearing that a competitor would snatch the opportunity, BP businesses wishing to acquire another company would often try to speed up the examination and the decision-making process. According to the PPA unit, such self-imposed deadlines are usually illusory. Moreover, the unit has found that if the company is not satisfied about the soundness of an acquisition proposal, BP will probably not regret the missed opportunity.

BP used to expand plant capacity without knowing whether it could sell all of the product the new plant could then produce. Now before adding capacity or introducing a product, the company requires planners to submit a full market survey to verify that a market will exist and be profitable.

Evaluate contractors

BP now has a contractor evaluation unit that monitors potential contractors' performance. When it solicits bids, the corporation already knows which contractor would be most likely to perform to its satisfaction. Formerly, BP used an unsophisticated method to select contractors. It was ignorant of contractors' deficiencies and performance for other companies in different parts of the world.

To make certain that a contractor has expertise in a project's process technology, BP now pays careful attention to the caliber of the contractor's key staff members and insists that they remain with the project to the end.

Improve project management

Engineers do not automatically make good managers. The company frequently used to send an engineer from a project in one part of the world to one halfway around the world. No one asked whether the engineer was familiar with the project, the country, or even the main contractor. At the recommendation of PPA, BP set up a projects department that helps engineers develop appropriate control techniques and procedures and ensures that the right person manages the right project.

To make project progress reports more constructive, the projects department has set up a projects control division. This division uses software programs, linked to each project, to help the project manager issue reports that identify likely problems and give reasons for missed milestones. These reports can be fed through the project control division's computer center for evaluation on a day-by-day, or even a minute-by-minute, basis.

The projects department ensures that project managers are appointed early enough to involve them with the design considerations, project strategies, and control mechanisms. With the projects department's guidance, project managers can make more independent decisions.

Capital investment analysts have usually swamped managers with advice based on well-meaning academic research, but it has been limited to questions about acquisition. Now, through post-project appraisal, managers can get sound advice on questions about many kinds of projects from the experience of their own companies.

sues that may seem unrelated to their areas of expertise. Those working out in the field often live together, eat together, and go out drinking together. Not surprisingly, an accountant may offer a cogent insight about the head engineer, even though they did not actually work closely with each other.

Sending PPA teams into the field to conduct investigations is far more expensive than sending out questionnaires—and far more effective. Because a questionnaire is a set collection of questions, it can elicit only a limited view of the project. In an interview, people offer unexpected information;

also, the PPA team can lead an interviewee away from digressions.

Conclusions and reactions.

The post-project appraisal unit has had very little trouble getting cooperation from BP's staff. In the unit's nine-year life, the PPA teams have found that people genuinely want to help the company grow more profitable by joining in an examination of performance. Even individuals who have been singled out for blame continue to see the unit's value. In one case, an appraisal concluded that a senior manager had not done his job well. The corporate review committee

called him in and raked him over the coals. For some time, relations between the manager and the PPA unit were cool. But a few months later, he telephoned the PPA manager to ask if the unit had appraised any projects similar to one he was beginning. He wanted advice.

The staff cooperates with the unit partly because it gives them a chance to take issue with conclusions before they appear in PPA's report. It is a testament to the fairness and accuracy of the unit's work that no one has ever taken advantage of this opportunity. [Continued on page 132]

After the team has exhausted the files, interviewed everyone involved, and digested and assembled the information in a preliminary draft to circulate to key managers, it submits a final draft to the business board and then to the corporate review committee.

The most valuable lessons come from the biggest projects, where the most money is at stake.

The committee carefully considers PPA's work and almost always supports the conclusions: it has received many hundreds of recommendations and has rejected only one. This suggestion—that BP maintain a staff of experts in different metallurgical technologies to supplement contractors—was simply too expensive.

BP does not circulate throughout the corporation the full reports on each appraisal, although these do go to relevant managers, but collates them into three booklets—one on acquisitions, another on joint ventures, and the last on project development and control. PPA regularly updates these booklets—adding lessons learned from later appraisals and occasionally deleting a lesson that no longer applies. One was a recommendation to build refinery plants on the Continent rather than in Britain because of poor labor relations in the United Kingdom. But labor relations have improved greatly since then.

BP's upper management expects project planners to use the information in the booklets as guidelines when writing proposals. A proposal that does not meet all the guidelines should not necessarily be abandoned. But if planners cannot comply with the guidelines, the corporate review committee will want to see that the proposal accounts for the possible risks.

PPA sends the booklets to the London headquarters of each of BP's 11 businesses and to each of the approximately 30 major BP associate companies worldwide. If any section of

the corporation needs more copies, the unit willingly sends them along. The PPA philosophy is that the company's investment performance will only improve as more BP people learn what went wrong and what went right in the past.

From its experimental and tentative beginnings a decade ago, PPA has grown into an integral part of BP's planning and control process. It succeeds because of its consistent reputation for digging out the truth. The unit enjoys the full confidence of BP's senior managers and directors because they believe that both the facts and the conclusions in the reports are accurate. This accuracy is based on the investigating team's thoroughness, its understanding of the technical issues, its fairness in evaluating the evidence, and its sensitivity to the psychological forces motivating the staff. In that accuracy lies the usefulness of the lessons to the corporation and the success of the post-project appraisal unit.

Appraisal lessons

There is a big difference between classroom lessons about business and lessons drawn from experience. What might seem self-evident or unlikely in theory may be the most important factor in an actual event. To illustrate, let me describe a project from a time before BP implemented many of the procedures PPA recommended.

In 1967, a director at BP responsible for engineering and refining wanted to explore a technology that Exxon and others were using but that was new to BP. The man was well respected within the company and had a great deal of influence. By the force of his personality, he pushed through a proposal for the construction of the biggest plant of its kind that BP had ever built. Exxon had a plant that turned out 30,000 barrels of oil per day on three production lines; the BP installation would produce that volume on a single line. This line required the largest compressors and pumps that BP had ever used and completely new technology in the reactor vessels.

During construction and testing, the company had difficulty with all three. It had particular trouble

with the reactor vessels, which, because of their size, had to be thinner than conventional vessels and thus needed lining with stainless steel. Despite assurances to management that the job was easy, BP's contractor ran into one problem after another. Finally, BP's own engineers solved the problems at great expense.

BP learned much from PPA's investigation of this experience. It learned that it must assess proposals more carefully. It learned to assess a new technology's risks more thoroughly and more objectively. It learned that it had to improve its method of selecting contractors. Perhaps the company should have learned these lessons already. But obviously it had not—and the post-project appraisal process brought them to light, formalized them, and collected them in one place.

Managers in every company are making mistakes no one thinks could be made. Time after time, the post-project appraisal unit has uncovered these kinds of mistakes and helped British Petroleum avoid repeating them. ♡

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