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Mod IV Product Development Team

It was April 1989. Just four months remained until the Honeywell Building Controls Division (BCD) planned to introduce the Mod IV, and the product development team was fighting to stay on schedule. Mod IV, a motor used in heating, ventilating, and air-conditioning (HVAC) applications, represented the most ambitious project in the division's history, and the product's development reflected many of the changes the division had experienced in recent years. For three people in particular, Mod IV also typified the challenges of working amid new pressures and demands.

As director of HVAC Controls, one of the Building Controls Division's four product areas, Linda Whitman was the senior marketing person for the Mod IV product line and had primary profit and loss responsibility for Mod IV. She could see the impact a delay would have on her area's performance, and she understood the pressing market need to have Mod IV contain attractive features. When she first became director of HVAC Controls in 1986, she realized that marketing had to play a more active role in development of Mod IV. Since then she had watched her fellow marketers on the Mod IV team work through problems and conflicts with engineers, and she knew some of the most difficult issues still had to be resolved. But addressing any issue required patience, persistence, and tact, and even then Linda often found herself torn. She had to make sure HVAC Controls met its projections, which required collaborating with engineering and manufacturing, both of which seemed at times overburdened and at times unresponsive.

Larry Rodgers, lead design engineer on Mod IV, had been involved in the Mod IV project for five years. He could sense the pressure mounting both on the team and on the division as Mod IV encountered difficulties entering the final months of the project. Larry and six of the engineers he supervised had their hands full trying to reduce the noise the Mod IV motor was generating. He knew the marketers had concerns about Mod IV's appeal to customers, but with BCD's limited resources and its stress on fast development, he wondered how he could address himself to marketing's concerns at this time. Like many engineers at BCD, Larry understood the competitive and financial challenges BCD faced, but he wondered if others appreciated the depth and complexity of design work and engineering problems.

Research Associate Joshua D. Margolis prepared this case under the supervision of Professor Anne Donnellon as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation. Figures in this case have been disguised.

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John Bailey, general manager of BCD, could all but hear the footsteps of competitors eager to grab business from his division. Although he bristled at the thought of a delay and its effect on BCD's ability to meet corporate financial targets,¹ he wanted to respect the team's autonomy. John knew the team was grappling with several troublesome issues, and though he focused his attention on making sure the division met its objectives, he wanted to find ways to support the team as it addressed the problems before it.

Building Controls Division

Honeywell Building Controls Division (BCD) produced climate controls and systems for four market areas: HVAC, burners and boilers, lighting, and water products. BCD employed 1250 people and recorded 1988 sales of more than \$150 million. The division dealt with two types of customers, original equipment manufacturers (OEMs) and trade customers. The OEMs incorporated Honeywell products into their own products, which they in turn sold to the market. Trade customers sold Honeywell products directly to the market. BCD placed highest priority on the quality of its products, on the division's flexibility, and on its response to customers. The division's profitability and return on investment—both well above industry averages—were points of pride.

1981 marked the first and only year in Honeywell's history that its Residential and Building Controls Division lost money. Controls were Honeywell's original business, and the shock of 1981 brought new management to this division, management determined to regain Honeywell's competitive edge. As part of the recovery process, Honeywell split residential and building controls into two separate divisions, thus creating the Building Controls Division. To end the days when people from engineering, manufacturing, and marketing/sales worked in different locations, a new building was constructed with enough room to house everyone. To integrate the three major functional areas, BCD introduced a series of changes that intertwined to create a new form of product development. BCD hoped to transform itself into an agile organization capable of outmaneuvering competitors through faster development.

Product Development and the Controls Business

In the old system of product development, the product passed through each functional area in a sequence of discrete steps: marketers conceived of a product idea and passed it along to design engineers, who would design the product and pass the design to process engineers; process engineers determined how to make the product and then dropped the plans into the laps of the manufacturing engineers and the plants. At each stage in the sequence, people encountered problems created by work done at earlier stages. Process engineers, for example, would discover they could not make what the design engineers had crafted. Product development thus became a game of "tossing the bear over the wall." When you completed your particular

1. A widely-cited economic model developed by McKinsey and Company "calculates that going 50% over budget during development to get a product out on time reduces ... profits by only 4%. But staying on budget and getting to market six months late reduces profits by a third." (David Woodruff and Stephen Phillips, "A Smarter Way to Manufacture," *Business Week*, April 30, 1990, p. 111. See also Brian Dumaine, "How Managers Can Succeed Through Speed," *Fortune*, February 13, 1989.)

piece of the project, you tossed it over the wall to the next group, not caring what took place on the other side. If you had problems with work done at previous stages, you made your changes and tossed the design back to the previous group for them to adjust their work. The process was slow and costly. Every change meant more time, higher cost, and heightened animosity between functional areas.

But rapid changes in the controls business inspired the division to look for new approaches. John Bailey explained:

In the early 1980s the move to electronics and microelectronics was accelerating, and we were having a hard time dealing with that by using engineering and manufacturing techniques that had evolved over one-hundred years and were slanted toward a really slow-moving industry and slow-moving technology. To suddenly get into a cycle going from products that you could design and have on the line for thirty years, to three years life expectancy—well, we couldn't do a *development* in three years. So there was a big need for change imposed on us by technology and by the new competitors that technology brought into the market.

We went from a period of a really stable competitive environment, with two or three players, to at one point in the early 1980s we counted 160 competitors—150 of them were little electric assembly shops, where a couple of engineers would get together, lay out a circuit board, stuff it, and start selling. A few of those competitors grew up, prospered, and became viable. They grew out of that change in technology. But it meant we had to change.

Change { We had to change for many reasons. We were coming out of a period when we weren't profitable enough. We were changing because we were going from part of a division to a stand-alone division. Our competitive environment was changing, technology was changing, and our customers were demanding a different set of requirements from us. So there was no alternative but to change.

Parallel Development and Teams

When BCD abandoned sequential development in the mid-1980s, it embraced a new process called "parallel development." In this system, a core team of people assembled from the three critical functions—manufacturing, marketing/sales, and engineering²—worked together to guide a project from the conceptual stage all the way through final production. People still reported to their functional managers, who continued to supervise and evaluate all employees, and each functional area continued to perform its specialized role on the project; yet all areas now worked on the same project simultaneously. The core team guided and tracked the development, coordinating efforts across functions and addressing issues of mutual concern. A program manager secured resources for the team, orchestrated its work, kept an eye on the complete project, and served as a liaison to senior managers. One BCD employee described the personal effect the new approach had:

2. "Engineering," when used alone, refers to both product and process engineering.

The team system does not allow people to single-mindedly defend the position of their functional area, of what's easiest, or best, or cheapest for their own functional area. It forces people to look at a bigger picture.

As BCD made the transition to parallel development, it had to confront its history and discard old habits. Marketing had always enjoyed a sacred position at BCD, as John Bailey explained: "Marketing called all the shots, controlled the purse strings. Engineering felt it worked for marketing." To make the team-system work, Bailey and his senior staff felt they would have to create parity among the functional groups. Each area had to see itself as an equal partner and contributor. People had to accept additional responsibility -- responsibility for the success of the entire project, not just for their functional role. Team members now had to attend team meetings whether relevant to their functional area or not. A manufacturing engineer, for example, had to attend team meetings even if the project was only at a design stage. Since people were accustomed simply to completing a task and passing the project on, they felt team meetings stole time from doing actual work and added to total work-load. As people gradually adapted to parallel development and teams, they continued to struggle with their expanded roles and responsibilities.

Many people at BCD felt the new product development system exerted too much pressure on them. Because people now worked on projects from beginning to end, not just when their piece had to be done, they had multiple projects to juggle at once. Combined with the emphasis on fast development, this at times overwhelmed BCD employees. Several people described the pressures they felt and what they perceived to be their sources:

Not enough resources
We have to make a decision on the deployment of resources. When it comes to choosing between things to do, the answer from above is, 'Do both'—with no added resources. Or if we get additional resources, we're just stealing them from another project.

No work schedule
The system is heavily loaded, especially since we're learning a new way of working. There are many things to do with little headcount and no relief with the project schedule. Engineering doesn't have a realistic schedule. This puts stress on the system.

Unsupportive management
Teams could help but there are obstacles to having a team work on a project. You need true support from management. If somebody's supposed to be dedicated to a team, management has to be willing to let that person spend all of his or her time on the project. Logistics also need work. You have to be able to work out the fractions of people's time. You need one fully dedicated person from each function, but you also rely on the entire functional group. So people working on multiple projects have to know how to split their time. How do you prioritize projects? All work is high priority. And how do you reward people?

Even John Bailey recognized he would have to alter his management style.

The tone of the way the division is managed comes right from the top. If I want teams, and I promote 'em and cultivate them, then there will be teams. If I'm going to dictate orders, then that's the way my staff will

act— dictate orders. I mean those things get reflected right through an organization because I think people look up to see what's happening, and if you don't lead by example, then you're not going to get what you want. People watch actions more than words.

I can't be autocratic and dictatorial to my people, as I tended to be when I was vice president of marketing with Honeywell Europe. All other things being equal, I'm a pretty good dictator. I'm very comfortable with that style. Part of the problem is, I grew up in this business. I understand HVAC. It's real easy for me to tell people what I think they have to do on almost any issue. But if I do that, and my staff does that, it goes right down the line, and we don't have teamwork. We also don't benefit from the ideas and perspectives of the whole work force.

So I've tried to learn to have patience, change my style, look for consensus, have involvement of my staff as a team, share more information, be more open. I've had to learn that you take a risk with this and not everything comes out the way you want it, but the potential payoffs far outweigh the risks.

I don't know how you legislate dedication, creativity, or motivation into people. I don't think you can. You can't tell people they have to do it a certain way. What you do is create the environment and the responsibility and be flexible.

But those are all new things for me. I didn't come to this as a natural team player. I got into this because it looked like the way this business could run best.

People throughout BCD spoke highly of John Bailey, crediting him with creating a vibrant climate, but they perceived remnants of an autocratic style. Two stories circulated widely through BCD, highlighting both John's own struggle to change and the two sides to communication within the division. One story detailed the way John and his staff calmly received a team's decision to cancel a project and start anew after the team determined the initial plan to be unfeasible. The other told of John's visit to a team meeting—to show his support—where he learned of a time delay. Although John made sure not to criticize the team, he was visibly upset and subsequently castigated his senior managers for not informing him of the delay. Some of those managers were themselves unaware of the delay, and the team both sensed and learned of John's displeasure with the news.

Using parallel development, BCD management believed the division was now in a position to make better products—and in less time. Because all functional areas participated in the entire development, team members could understand the needs of their teammates and could work on their pieces of the project with those requirements in mind. Engineers could design a product with a better grasp of customer needs and manufacturing requirements, while manufacturing and marketing people would understand the limits of what the engineers could do. Instead of tossing the product and problems back and forth over walls, teams could identify potential problems and prevent them. The walls could come down as people from different functions talked with one another more frequently. Fewer problems and overlapping work would deliver what John Bailey

coveted most: reduced development time. According to the division's estimates, the new product development system had reduced development time from an average of 38 months to an average of 14 months. John saw speed as BCD's weapon for reclaiming competitive prominence, and he campaigned tenaciously to cut the time it took to get products from "concept to carton."

Although people attributed much of the division's resurgence in the 1980s to the close working relationships that now existed between different functional groups, there was some feeling that antagonism had not evaporated entirely and that finger-pointing still occurred. A marketer and an engineer gave separate examples:

From a schedule standpoint, engineering's credibility was no good. They were telling us dates that just weren't getting met. We tried to arrange shared goals and objectives, and it was like pulling teeth from engineering. They said they had their own milestones. The first shared deadline they suggested wasn't valid since we needed things from them well before that.

We in engineering thought we had a minor design problem that we could solve as we worked on other problems. However, the problem didn't go away, so we moved it up on our list of priorities. Finally, we had to blow the whistle on ourselves because we felt the changes would require more time than the schedule allowed. We went to the head of marketing with our position. We said we were making progress but did not feel we would make our introduction date and needed more time. He said we had to stick to the dates we had. It's his prerogative to demand that the target dates be met, so the target dates were not changed, even though the team knew we weren't going to make it. Insisting that a date not change, though, can lead to a project problem. I'm not sure what's accomplished by insisting on unrealistic dates.

Mod IV

With its new strategy for product development, BCD approached the Mod IV project intent on "making the dates happen." John Bailey explained the urgency behind the project: "Two competitors have introduced new products and retooled. They have overcapacity and are just waiting to steal market share. We cannot make a mistake." BCD was spending \$19 million to develop Mod IV and planned to have it replace products accounting for over 30% of the division's profit. These figures led one senior manager to call Mod IV "our golden egg." Although the golden egg was about to hatch, Mod IV had had a long gestation.

History of Mod IV

In 1981 Jay Elander, process engineer on the current Mod IV team, was asked to examine how the company could improve the quality of its motors and reduce their cost. His study turned into a cost-reduction, quality-improvement initiative executed in three phases. Mod IV represented the final and most ambitious phase. Although inspired by engineering, Mod IV promised the most dramatic innovations in manufacturing and therefore was deemed a "flexible manufacturing project." With the one Mod IV motor line, BCD planned to *automate* its entire assembly process and replace four families of motors—a total, per year, of more than 200,000

motors and over \$20 million in revenue. The project promised to reduce costs and improve profit margins, making it attractive to the manufacturing people. But some marketers were concerned that customers would not accept this new motor and BCD would lose market share. That would reduce revenues, the primary index of marketing's contribution to the organization. The team, however, intended to offer a product replete with features and enhancements attractive to customers. The team would then use price incentives to encourage customers to convert to the Mod IV.

BCD began work on Mod IV in 1984, prior to the introduction of teams and parallel development, but the same design and process engineers had worked together on Mod IV from the beginning. They had even carved out an open office area, nicknamed "the bullpen," by removing partitions between cubicles and setting up a central conference table. Manufacturing engineers were frequent visitors to the bullpen and initiated many of the impromptu meetings. Design, process, and manufacturing, however, did not collaborate closely with marketing until 1986, when the current Mod IV marketing people began replacing their predecessors on the project. One engineer spoke about marketing's involvement:

The marketing people have changed since the project began while the engineers have been the same since the beginning. Marketing decisions changed each time the marketing people changed. We had to do two rounds of market research. This has had a negative psychological effect. It leaves the impression that the rationale developed in marketing is only as good as the people who developed it. So we lived through a change of direction. Not one marketing person is the same as when the project began.

For a long time, marketing didn't buy into Mod IV. They were forced enthusiastic. Now they're enthusiastic because it's a better product, but it's been a lot of extra work for them. They would have been better off with the combination of the old product and the absence of this extra work.

From the time Linda Whitman became director of HVAC Controls in 1986, she had collaborated closely with her peers in other functional areas. As she put it in terms of Mod IV, "Manufacturing and engineering were a whole lot further ahead in the project. And if it was going to be successful, there had to be a balance in terms of expertise and authority." Linda stressed equal participation, but her role as director gave her unique responsibilities.

I feel that it's a mini general manager position. I think that's the way business-unit directors are expected to perform. Of all the players, we have ultimate responsibility for the P&L [Profit and Loss]. And I am responsible for my engineering deliverables. The engineers do not report to me, but I am accountable for telling them what projects to work on and in what order. Likewise, sales does not report to me, but my marketing group controls the revenue plan and unit-sales targets they must achieve to earn bonuses. We're also responsible for developing their programs for customers and for authorizing special deals.

We're responsible for defining the product road-maps and introducing the products. We provide the technical support to customers -- the training, the hotline, the technical support for the field reps. We're in charge of pricing, advertising, and sales promotion activities. We're also responsible for arbitrating unresolved delivery problems and for determining delivery codes and lead times. It runs the gamut.

Linda explained how marketing had to make up for lost time on Mod IV:

Marketing was uninvolved for a long time—for two reasons. First, it was never a marketing-driven development, which is highly unusual. Second, marketing was so Johnny-come-lately. By the time we had a solid marketing team established, engineering and manufacturing were entrenched in the way they believed it should be done. That made it much harder when we did come along.

The new marketers' concern led the team to revise the project's scope, but marketers still had some lingering uneasiness. A marketer explained:

Mod IV is replacing our bread and butter for no market-driven reason. Sure, it's a cost reduction and a quality improvement, but our motors already are very high quality and provide high margins, so from a marketing standpoint, it didn't have to be done. The customer-benefits derived from Mod IV, including modules, could be developed for our present motor lines.

Team Members

Linda Whitman -- Director, HVAC Controls. Linda became the head of marketing for HVAC Controls, one of BCD's four market areas, in early 1986. In nine years with Honeywell, Linda had progressed through five positions, each time dramatically improving the department she supervised. Although Linda succeeded in each of her new positions, with three of her job changes she replaced an incumbent man who had been relegated to another position; as she acknowledged, "This was not the easiest thing for me."

Linda described herself as "results-oriented, hard-driving, intense, and compassionate." Organization, discipline, and strong strategic planning were Linda's hallmarks, but she insisted on letting her marketers work autonomously. She enjoyed working at BCD and praised its comfortable, diverse environment. Her management style, though, had caused her to think about "being female in an engineering-dominated, midwestern manufacturing company."

It's extremely difficult for many people to accept a woman who's hard-driving and results-oriented the same way they can accept a man in that role. It's the old classic. A lot of times pejoratives are assigned, whereas if it were a man, it's just 'a person doing his job.' I think there's much more forgiveness for men to have quirks than there is for women.

Linda was in her mid thirties.

Jack Scott -- Program Manager, Manufacturing. Jack served as Program Manager while also supervising the project's manufacturing efforts. He also supervised several other manufacturing activities. Jack had joined the Mod IV team a year and a half earlier, and though he had known all of the project's engineers for ten years, he called himself "the new kid on the block." Jack described his role:

I try to keep all ends tied together for the net result. Where are we on tooling dollars, engineering design, order and delivery of the production machines? I tie all the pieces together to make sure they hit the floor at the same time. I make sure communication is happening so that all things are getting done. I make sure we don't get one of these things where we get all done and someone says, 'You didn't tell us about that.'

Jack was in his forties.

Jay Elander -- Senior Principal Process Engineer. "Father" of the Mod IV. Jay's 1981 study led to development of Mod IV, which he now worked on. Jay was in his sixties.

Larry Rodgers -- Mechanical Design Manager. In charge of all engineering efforts on Mod IV. Larry supervised all seven design engineers working on HVAC Controls products. Six of those engineers were working on Mod IV, and Larry himself had worked on Mod IV since it began in 1984. Larry displayed constant equanimity, rarely letting the pressure of a situation disturb his demeanor, which some considered aloof. However, he readily acknowledged the history of tension on the project:

The impetus for the program was increased profit. The project is attractive to manufacturing because they're profit-driven. Marketing is revenue-driven, and this product may reduce revenue. Since it will cost less to make the Mod IV, customers will want it for less, and that will reduce revenue. Engineering's objectives are to deliver at cost, on time, and with the specified features. Dates are our driver. Engineering is neither revenue nor profit driven. We're market driven, but we respond to manufacturing as well.

To bring the product to market, engineering has to do certain things and marketing has to do certain things. What marketing has to do is often dependent upon engineering support. But what marketing needs engineering to do is not necessarily the next thing on the list of priorities for engineering.

Larry was in his forties.

Phil Bohrer -- Mod IV Project Manager, Marketing. Phil spent the first part of his career as a research engineer, and after receiving an MBA, took this marketing position in June 1988. As the only marketer working full-time on Mod IV, Phil was marketing's field marshall on the project, responsible for the product's smooth introduction to the marketplace. But Phil was not always comfortable with this task because, as he saw Mod IV, "It's replacing our bread and butter. It's kind of scary. I'm feeling reasonably comfortable, but there are some things that make me feel uncomfortable." He attributed the tension between marketers and engineers to the project's

history: "It's somewhat a power struggle because this has been engineering's baby. Engineering saw marketing as just getting in the way." Phil was in his thirties.

Dick Bahn -- Product Manager, HVAC Controls. As Product Manager, Dick supervised all technical content of HVAC Controls products, serving as the liaison between field sales and engineering. Dick spent the first 15 years of his career in engineering, where he had become friendly with Larry Rodgers when they both designed industrial air quality products. Dick joined marketing in 1986 and had worked on Mod IV since. Although his responsibilities spanned all HVAC products, Mod IV was the most important, so Dick attended the regular meetings and occasionally discussed the project with Larry. Dick also served as a mentor to Phil, who kept Dick apprised of Mod IV news. Dick's engineering background, friendship with Larry, and personal style made him a vital member of the Mod IV team. He understood the technical difficulties confronting product engineers, and his friendship with Larry helped ease tension when marketers had to push certain issues. Dick was in his forties.

Gordon Frayne -- Market Manager, HVAC Controls. Gordon supervised marketing efforts directed at OEMs, customers who incorporated BCD products into units they in turn sold. He maintained a focus on customers, whereas Dick focused on products. Gordon started at Honeywell in sales. He had been the product manager for Burner and Boiler Controls just prior to joining HVAC Controls in 1987. Although Gordon devoted his time to many projects during the week, Mod IV was the most important product he had to introduce, and the weekly team meeting gave him an opportunity to learn about the project's progress, provide input, and voice his concerns. He described the role marketers played on the team:

Marketers with an engineering background have a tendency to tell engineering how to do things. People on our team are getting better at not doing that.

Marketers are forced to be confrontational to make things right for the customer. We've all had to play the bad guy at times. But Phil has had to make sure that the product can be introduced. That has put him in the role of 'lead bad guy.'

Gordon was in his thirties.

Team Meetings

Since autumn of 1988, the Mod IV team had been meeting Friday afternoons to discuss major issues and to resolve crossfunctional disputes. Although team members interacted almost every day, the meeting guaranteed joint discussion and allowed the team to delve into issues, address all concerns, and come to a resolution with all parties present. Team members explained why they often tumbled into conflict:

- "The risk at stake here is very high. Conflict on our team results from a desire to reduce risk. This product accounts for 30% of BCD's profit."

- "We've had a lot of problems with language on this project. We've had a lot of semantic issues with the differences between what's literally required in the application versus what's required in

order to position the product in our distribution channel. What's been hard about that is we haven't known we've disagreed.

"For example, we asked distributors whether they would need more single-shaft or more double-shaft motors. The distributors said, 'The majority of applications will be single-shaft.' Engineers and marketers were sitting in the same room, listening to the same distributors say that. Engineers took that information and prepared to make primarily single-shaft motors. When marketers found out, they felt it was a disaster. Regardless of where the majority of applications fall, the distributor always wants to make sure either case can be handled, so the distributor will stock double-shaft motors, which can also be used for single-shaft applications. We all heard the same piece of information in the same setting. Engineering was listening for the literal application. Marketing was listening for the customer's buying preferences."

• "I worked on the biggest 'It will happen' project in the history of the United States—the Apollo project. They said, 'You will get to the moon.' But we couldn't go until we were ready. And Apollo had unlimited funds. If management thought someone or something could help, the project got it. Mod IV doesn't have that luxury. I can understand why BCD management can't run over on cost or schedule. They can't go to corporate, whatever the justification, and say there's been an overrun on the motor. Honeywell can't accommodate that right now. It's blind, though, to think that just by saying something's going to get done by a certain date, it's going to get done."

• "Because we do many things at the same time in crossfunctional teams, the discrete checkpoints get lost. Definite meanings don't exist."

• "Larry [engineering] and Phil [marketing] are the two most prone to clash. It's because of their roles. The two roles are adversarial. Larry and Phil have to represent different interests. Larry's is what's fastest and least expensive. Phil's is what's best for the customer."

April 1989

Mod IV was behind on both design schedule and production schedule. Still, the team was fighting to meet the August 1989 date for introducing Mod IV to the marketplace. The marketers were busy preparing a training video for Mod IV users. The engineers had their hands full with a noise problem. And the manufacturing engineers were ordering parts and arranging the assembly lines. The team as a whole still had to decide about control modules.³

John Bailey was aware of the difficulties confronting Mod IV.

We have several problems going on right now, and I'm not really happy about them, but no one expects me to be happy about them. But I know all those people are really working hard to resolve the problems. Now if you jump in there and shout, or accuse, then what you're basically saying is you don't have faith in the people you've assembled to get the job done, or you don't think that they're giving it their best effort. We

3. A control module would allow users to tailor the motor for different applications. It is discussed further in the text.

may lack some skills in the technology we're in, but basically I think we have a good set of people, and I think they're working really hard. My job is to support them rather than shout at them.

My highest priority on this project is quality. I know it's \$19 million and the clock's ticking on the cash-flow and all that, but our bread and butter is the motor line. This new motor has to be equal to the performance of the old one, has to be, because we have such a good reputation, and we have two competitors out there just waiting to take our market share. So I can't risk performance problems on the new motor, even if we have to say we'll never run the \$19 million investment. It would be better to do that than to risk our share.

Yeah it bothers me that the machines are sitting there and we're slipping. But I'm comfortable that we really are making it right, and we're not going to go forward until we have confidence that we can make it.

We sometimes hasten to assume that people want to be directed. I try to listen to a team's problems, make them feel empowered, and suddenly they feel they can climb mountains. It gives them an emotional lift.

If I think they're giving it their best shot, and problems are occurring because of the technology, or because of resources, or because of vendors, then let's go work those problems. Work the things, the issues. Don't blame the people. I think we have good people. They're working hard, doing the best they can. If there's a problem, maybe we didn't select the right ones for the team, maybe we haven't trained them right, maybe we haven't given them the right resources. Let's go work those issues.

John wanted to respect the integrity of the team, but he also had to consider Honeywell's posture toward Wall Street. To make itself a less desirable takeover target, Honeywell had adopted a plan requiring each division to cut costs and improve financial performance. A *Fortune* article described how Honeywell CEO James Renier planned to handle the challenges:

How will Honeywell fend off the poachers? Says Renier: "Get the share price up. There is no other answer." To do that, he must boost performance in the core businesses, which may require a less-than-gentle touch. Asked if he is, as one analyst described him, more of a "butt kicker" than his predecessor, Renier cracks a rare smile and says, "Sometimes it's necessary. It's been necessary with my kids. I have eight, so I know something about it."⁴

Since BCD had started using teams, John had grown accustomed to serving as a buffer, and the financial requirements only added to the pressures he had to absorb.

4. Ronald Henkoff, "Butt Kicking at Honeywell," *Fortune*, 22 May 1989, p. 141.

We're running at the best return rate of any manufacturing division in the company, and we're being asked to do more. What I'm being told is, 'Perform better in the short term.' But my people here have talked for years about working toward the long term—this is our strategic direction.

Everybody sees the task we have in front of us and is asking how we can do it. I'm saying I don't have all the answers. Let's just prioritize what's most important. Let's look at as big a picture as we have responsibility for. I can't look at all of Honeywell, but I can look at all of BCD, and Larry Rodgers can look at all motor projects. Let's prioritize within our respective areas and see where we're going to get the best bang for our bucks.

As John reviewed the history of Mod IV, he put it in the larger context of the division's current challenges.

In hindsight, if I had it to do all over, I wouldn't try to implement a new design and a new line simultaneously. I thought we had laid out sufficient time between phases that we could manage it. But it's too much to ask. It's too many variables for one team to manage. We should have developed the design and made it off-shore or somewhere else or even here, hand-assemble it, even if it was going to be a cost-penalty until we understood how to make it, and then automate it, instead of trying to take a new design straight into automation. That's what I've learned. I'll never make that mistake again. I take that as my fault. That's not the team's fault. I never had a project this big before.

Now to maintain our level of performance in an environment where some of our historical competitive advantages are going away says that we've got to redefine the way we're going to compete. Just being the biggest isn't going to do it anymore, and so speed of response is one of the things we've nailed to the ground. We're going to learn to be a faster-response competitor, not just in product development but in order-processing, production, and shipping. It is a huge challenge to learn to do that, produce better financial results than 15% operating profit and 25% ROI, continuously, and grow. When I wrap that together, that is my challenge—to get all that done simultaneously. Use timing, instead of just manufacturing or global distribution, as a competitive weapon.

Learning to do that is a challenge, and maintaining all of those good ratios simultaneously with fewer resources to invest than we've ever had before—that's big.

Control Modules and Mounting Pressure

The team would have to gather soon to discuss control modules, a volatile issue that had inspired heated debate. A module could be added to a standard motor to change its function, thereby providing increased flexibility and eliminating the need to have distributors stock separate motors for different applications. The motor's flexibility would appeal to customers, and distributors would welcome the reduction in stock. Inventory management was a major concern

for distributors, but with modules and a base motor, distributors would now be able to configure their own special units and avoid carrying hundreds of different motors.

One competitor had introduced control modules in its new motor, and another competitor had followed with an even better modular system. Phil Bohrer, marketing project manager for Mod IV, concluded, "Motor customers expect Honeywell to come out with a better module provision." The Mod IV business plan did mention modules, but marketing and engineering interpreted the commitment to modules differently. Phil explained:

Engineering did not have a module provision and intended to solve the problem by having the distributor stock a large number of different circuit boards. We can't give distributors—our customers in this case -- the impression that they have to stock extra components because it saves us money.

Engineering doesn't consider modules important. They see modules as peripheral. They say that only the most sophisticated units need them, and that's only 10% of volume. But the varieties within that 10% account for over half of the total varieties of Mod IV motors. That's why the distributors don't want to stock extra motors or circuit boards.

Phil believed the Mod IV had to include a module to provide a feature customers desired. Although a module did not have to be available for the initial product introduction, Phil did not want to make this suggestion. Engineering, he felt, had dismissed the importance of modules for too long and might be tempted to use the offer as yet another way to postpone work on them. Phil wanted to get the engineers' commitment to develop modules.

Larry Rodgers understood the marketers' interest in modules, but with limited resources at his disposal, not to mention other design problems confronting him and his staff, he felt he could not actively develop them at this time. He outlined his concern with modules:

As we wrote the Mod IV Business Plan, modules were defined in concept but not in detail. The number of modules and their specific functions weren't detailed in the Business Plan.

At times, marketing establishes criteria that are very difficult for engineering to meet. Marketing defined a Mod IV case that is small enough to fit the product strategy but not big enough to fit the module, as we normally produce it, and everything else that has to go into the unit.

With regard to space inside the unit, we might be able to split the module into two parts, which would make it fit into the unit. That's not how we normally produce a module. It means additional plastic parts and therefore added cost, so I haven't entertained it as an option.

Larry and his staff were concentrating their efforts on solving a noise problem with Mod IV. The motor was producing excessive noise, and the engineers were trying to determine the source of the noise and correct the problem. Larry was confronting a classic engineering dilemma.

If there are design changes that involve a manufacturing tool, there is no way to test that change until the tool is completed, and that's a long lead-time proposition. Final testing of the change cannot be done until final production parts are available, and that happens precisely when we're also trying to move the product into production. So pressure mounts at that one time. There's also pressure up front when a designer suggests a change of this sort. There's simply no way an engineer can be sure a proposal will work when it's being suggested without giving adequate time to test it.

Linda Whitman also found herself in a typical predicament.

It's sometimes really hard for me to figure out what is the right thing to do. Getting new products out when we do requires prodding and nagging and pushing and cajoling and pleading. I'd prefer not to do all that because I see the tremendous loads engineering and manufacturing have, and I feel bad about bothering them. But if I don't keep after them, my revenue plan suffers. I understand the pressures they face, and if I push too much, I'll only alienate my colleagues in the other functional areas, and things will get worse. As it is, they're beleaguered. They're just stressed to the max. Putting more stress on people doesn't get any results.

When I'm feeling frustrated, it feels like there are two extreme courses, and it's hard to keep perspective on other courses of action. Is it best just to be real nice with them, be patient, and take the heat because I'm seen as not being able to get the deliverables out of engineering and manufacturing? Or should I be a jerk and say 'the heck with it, they never deliver,' and then they'll do even *less*. So it's really hard.

Surveying the challenge facing the team, one team member concluded:

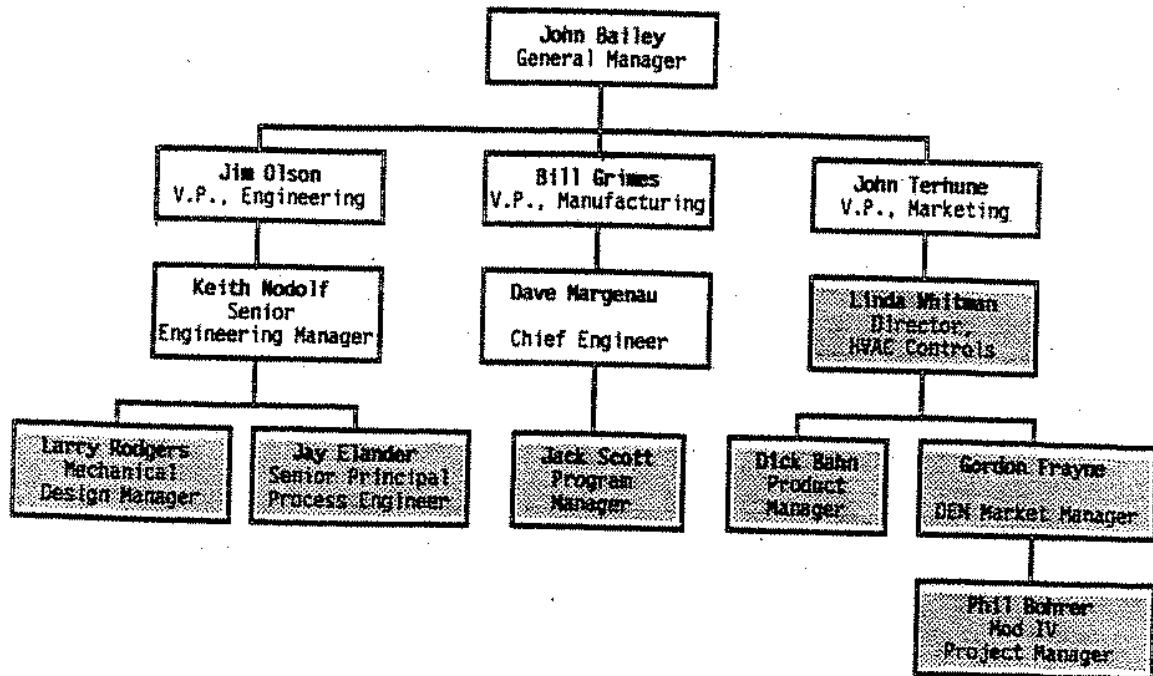
Pressure on schedule originates with Return on Investment (ROI). If the schedule is strung out, ROI decreases. That's a good reason to have milestones chiseled in stone—leverage, since things must be done by certain dates to achieve that ROI. It also lets customers know when things will be ready. But it's not good to insist on a chiseled date when it's clear you're not going to meet the date.

Production would have to start soon to assure punctual market introduction; any additions or changes to Mod IV would threaten a delay in production. Still, Mod IV had to meet strict quality standards and satisfy market needs.

Exhibit 1 Events

	<i>Division History</i>	<i>People</i>	<i>Mod IV</i>
1981	Honeywell Residential and Building Controls Division loses money.	John Bailey returns from Europe to become Vice President of Marketing for Residential and Building Controls Division.	
1984			First Mod IV business plan. First round of market research.
1985	Building Controls and Residential Controls begin operating separately. Marketing departments for the two are split. First project using teams.	John Bailey is head of Building Controls.	
1986	Building Controls Division officially formed. Engineering and manufacturing departments are now split between BCD and Residential Division.	Linda Whitman becomes director of HVAC Controls.	New round of market research.
1988	<i>Product Development Process Guide</i> released.	Phil Bohrer hired as full-time marketing person for Mod IV.	Weekly team meetings begin.
1989	May: Production start-up for Mod IV (projected) August: Delivery of Mod IV (projected)		

Exhibit 2 Organization Chart: Honeywell Building Controls Division



Shaded regions designate Mod IV team members.