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Sedalia Revisited

Ivan Gargarin, third plant manager of American Diesel's Sedalia Engine Plant (SEP) in Sedalia, Minnesota, was facing one of his biggest challenges. Changes were taking place on several major fronts as a result of a restructuring of the diesel engine industry; worldwide competition had forced American Diesel to become more cost- and delivery-conscious. The corporation had embarked on two new strategies: just-in-time (JIT) manufacturing and total quality systems (TQS); numerous cost-reduction projects were underway. In addition, American Diesel had an estimated 1,800 excess employees in 1986, 250 to 300 of whom were in SEP. Moreover, SEP was operating at about 40% of capacity. Gargarin was pulling in components that had been subcontracted to outside vendors and trying to sell some of SEP's services and capacities (such as tool sharpening and microfilming engineering drawings) to local manufacturers in order to reduce the number of excess people. But he knew he would still have to make a decision on work-force reductions in early 1986.

Since its founding in 1974, SEP had grown to more than 900 employees, introduced a new engine line, and weathered economic downturns in 1979, 1981, 1982, and mid-1985. The plant had avoided layoffs through a hiring freeze, voluntary one-month leaves without pay, work hour reductions (down to 35 hours/week for several months), and the creation of a "swing team" comprising excess people assigned to miscellaneous tasks throughout the plant. (See **Exhibit 1** for employment statistics.) There had been no serious threat either to SEP's nonunion status or to its "team concept."

But would the innovative plant design survive the challenges facing the company and SEP in 1986? Donald St. Clair, vice president of operations with overall responsibility for SEP (and SEP's first plant manager), had been quoted as saying that there was a need to reexamine the application of the precepts of the original organization.[1] The plant was originally designed to accommodate continual mid-course improvements to keep pace with market changes. St. Clair believed it was time to redefine how the principles were applied to the new business environment. But many team members and team managers[2] expressed concern about the current application of the concept:

> We've lost sight of the concept.
>
> Management is reverting to the traditional control mentality.

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[1] See "Sedalia Engine Plant (A)," HBS No. 481-148, for details of SEP design and start-up. All SEP employees belonged to semi-autonomous work teams in which team members were required to learn a wide variety of skills and perform a broad spectrum of functions.

[2] In March 1985 team advisors became team managers. Further details appear later in the case.

Professor Janice Klein prepared this case as a basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

> We're losing our team identity and individual freedoms with pull manufacturing [JIT].
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> There's less emphasis on vertical tasks and training because they're not viewed as value added.
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> The shift in the plant is from a human focus toward more business basics for survival.
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> The team concept is changing. This used to be a fun place to work. No rules. The changes are tightening things up and bringing the plant back in line with its original business focus. Now it's getting back to what the concept was intended to be.

According to a machining team manager, many of the negative comments were made by the more senior team members:

> The veterans, or those nonexempts who have been at SEP since we started operations, came into a plant that told them they would have a lot of freedom in the way the plant was managed and that they would have a lot of say. This raised their expectations about involvement and their freedom in how they spend their time. The newer people came into a plant that was much more structured, so their expectations are lower. As a result, they are much happier with the current state of affairs.

Changes in Business Environment

American Diesel had established a reputation for high-quality engines of superior reliability and durability. This reputation and the company's ability to tailor engines to customers' needs allowed it to maintain a market niche and a price premium. Like most other U.S. manufacturing concerns, especially those in the transportation industry, American Diesel's market changed in the early 1980s. Before then, American Diesel had held approximately 55% of the market share and competed primarily against other U.S. manufacturers. In the late 1970s, European and Japanese engine makers began to aggressively pursue the truck market. American Diesel licensed one of its engines to a Japanese firm, which quickly learned to manufacture similar engines at a significantly lower cost. It was estimated that the Japanese firm could produce an engine of roughly comparable quality for as much as one-third less than the cost of an American Diesel engine.

In addition, as overall market growth flattened, American Diesel sought to reshape its strategy, from attempting to gain market share to holding onto the replacement market. As a result, the company had to cut costs significantly to remain competitive.

In 1979 American Diesel introduced a new engine, the A200. This engine was designed for the same applications as American Diesel's standard over-the-road diesel truck engine, but offered the customer a smaller, lighter-weight model with improved fuel efficiency. It was also more suitable for the bus market, a major new opportunity. Although many of the A200's major components were manufactured at American Diesel's Beacon, Illinois, plant, SEP did the final assembly. Gargarin was therefore assigned overall cost responsibility for the engine. (A facility in the United Kingdom was assigned final assembly for engines sold exclusively in the UK and Europe, but the costs of these engines also fell under Gargarin 's purview.) This brought SEP into the corporate limelight: it would be responsible for a critical part of the organization's business. Gargarin and his staff would coordinate interplant and interfunctional relations, and as a result, Gargarin would spend a significant part of his time on matters beyond daily SEP activities.

In July 1984 American Diesel's president made a commitment to sell the A200 at a reduced price to gain market share and keep out foreign competition, primarily Japan. The manufacturing organization was given 30 months to cut the cost of each engine by $9,500, from approximately $16,200 to $6,700 per engine. Similar goals were placed on American Diesel's other engine lines. This "30-month sprint" placed significant pressure on SEP. In response, Gargarin established cross-functional teams, led by the business managers, to concentrate on the cost, quality, and delivery of the new engine. He set up monthly, sometimes weekly, review sessions with representatives from various parts of the corporation. They had to present the steps (including Gantt charts)[3] they were taking to meet cost-reduction targets, focusing on each component and cost category (labor, materials, and overhead). By October 1985, SEP had increased production to 75–80 engines per day from an initial start-up of 15–20 engines per day and had reduced the cost to $10,300 per engine. However, the market slackened at year's end, which reduced daily production to 60 engines. The traditional cost-per-piece measurements, evaluated against an historical base, were modified to reflect market prices.

JIT at SEP

Faced with foreign competition, the 30-month sprint, and a corporate suggestion to investigate and implement the Japanese philosophy of just-in-time manufacturing, Gargarin established a "JIT improvement group" in the assembly and test (A&T) area. The group, formed in the summer of 1984, consisted of a team advisor, an engineer, a materials specialist, and a team leader who came from material control. Group members began by scanning the literature, attending seminars, and visiting other companies that had implemented JIT. They found that other plants focused on three aspects of the operation: quality, materials flow, and work flow. SEP's group chose to concentrate on work flow.

Within a month, an implementation group made up of A&T exempt and nonexempt team members was established. This group was to work its way through all assembly teams by performing analysis, recommending solutions, and encouraging team participation. Its first step was to improve fixtures and tooling to reduce set-ups on individual workstations. The group videotaped every operation in every team, beginning at the front of the assembly line; all team members then viewed the tapes and brainstormed to find ways of reducing non-value-added work. After all the ideas were documented, the team estimated savings from each and identified the savings as short-, medium-, or long-term.

In July 1985 SEP hired a consulting firm that specialized in JIT to provide training and guidance for the JIT implementation project. The firm suggested that in order to achieve synchronous flow, or JIT manufacturing, the plant should eliminate buffers and provide a visual means of communication for people on the line. One month later, a design group was formed to condense the base assembly line according to guidelines suggested by the consultants. (The assembly line consisted of three portions: base engine assembly, engine test, and final parts mounting, which mounted customer-specific parts or decals and painted the engines.) The design group comprised four members from the implementation group, plus a manufacturing engineer, a quality engineer, a safety representative, and a material coordinator representative. Its task was to plan the physical rearrangement of the line and to lay out an implementation schedule. The group began by eliminating work-in-process buffers between teams 6 and 7. It gradually compressed teams 4 and 5 and teams 1, 2, and 3, leaving buffer inventories only between teams 3 and 4 and between teams 5 and 6. The final step, taken during the Christmas shutdown, eliminated all in-process buffers and reduced the base assembly line by 60% of its original size. In addition, 27 workstations were eliminated, leaving 52 as of January 2, 1986. What remained was an open area of about 67,000 square

[3] A Gantt chart displays a schedule of interrelated tasks, with each activity having a designated start and end date.

feet, which management hoped to fill with new business it was trying to entice corporate management to transfer to SEP. Throughout the plant other areas were opened up by inventory reductions; these were roped off and designated for new business. See **Exhibit 2** for a layout of the facility in January 1986.

Changes in A&T Team Autonomy

According to one team manager:

> The plant was originally designed based on a concept of "total team flexibility." Each team was considered a "mini-plant" with its own set of cost and delivery goals. Each team could decide when it would work; that is, it could pretty much set its own starting time, when it wanted to take breaks, and when it would stop for the day. JIT has eliminated much of the team autonomy relative to individual team members' freedom.

To allow for semi-autonomous teams, SEP de-signers had, prior to JIT, inserted a two- to four-hour inventory buffer between assembly teams and up to a five-day buffer between A&T and the machining teams. There also had been 20–30 days' worth of raw materials or purchased parts inventory, plus significant levels of work-in-process inventory, within each team area. To improve American Diesel's reputation for poor delivery (traditionally, meeting 20%–25% of its daily delivery requirements to a broad range of customers while maintaining excellent delivery to a few key customers), SEP held a finished goods inventory of approximately 600 engines in 1985. Delivery performance thereby improved to 70% of daily requirements, and some new sales opportunities were explored.

The implementation of JIT and the rearrangement of the assembly line in December 1985 had a significant impact on the amount of inventory held in the A&T operation. Inventory between teams was reduced essentially to zero, and inventory between A&T and machining was reduced to a maximum level of one day (with cams, blocks, and heads holding only four hours of inventory). Reductions in finished goods inventory were planned for later in the process and thus remained unchanged, but raw materials or purchased parts inventory was reduced to 10–15 days. The throughput of a complete engine, from the first assembly line station through test and final parts mounting, was reduced from nine days to four; the goal was to reduce that to one day.

All managers assigned to A&T (team managers, business managers, and the A&T director) were issued beepers so they could be paged whenever problems arose. During January 1986 it often seemed there were more managers than assembly operators on the line. Although most team members viewed this as positive because resources were available whenever needed, others felt they were under constant surveillance.

A system of red and amber lights and buzzers was set up along the line to signal any workstation with more than two boxes ahead of it (each box contained one engine). The line was programmed to stop automatically whenever this occurred: all managers swarmed to the troubled workstation to try to solve the problem while assembly operators, other than those at the source of the problem, cleaned up their work areas and rearranged materials to prepare for resumed operation. Although a 30-minute break had been added to the morning schedule, some operators used the line downtime to run to the restroom or get coffee.

Initially, team members did not believe the JIT changes would be physically possible, and some reacted negatively when they returned from the December shutdown (when the rearrangement had taken place). The seven assembly teams would maintain their identities but now also had to function as one large entity; many team members felt their individual freedom had been taken away. They all had to start at the same time, take breaks together, work at a more even pace, and meet a six-

minute cycle time. Many perceived this as working faster. One team member began wearing a T-shirt that said "I'm in cell block #3." Another nonexempt team member, whom a colleague described as one of the best workers on his team, was particularly resistant to the ideas of the JIT improvement group. As a result, he was assigned to the performance improvement process counseling program to deal with his obstruction of the JIT program.

Impact of JIT on Machining

Although the JIT improvement group began with A&T, it planned to extend JIT throughout the plant and to outside suppliers. The goal was to implement JIT in the head line by the end of the first quarter of 1986 and to expand into other areas at the rate of one per quarter. In the meantime, all machining teams continued to build to inventory as they had always done. In most areas, however, the overall inventory level had diminished significantly (ranging from 4 to 24 hours), and the teams had begun analyzing nonvalue-added operations in anticipation of JIT. The changes in A&T, however, had an immediate impact on the machining teams. The camshaft's material coordinator commented:

> JIT has had both positive and negative aspects. On the positive side it has made people more aware of our assembly line. They really do build engines here! It has forced more changeovers of machinery, therefore forcing people to find more efficient ways to make changeovers. It has also made more team members involved in team production and scheduling. Lastly, it has made us more independent of upper management. Therefore, I think it has eased some of the load on management.
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> But JIT has meant frustration among all team members: Since assembly stopped holding any extra inventory, the lines must hold a small amount. There is never a comfort zone. Just when they think they've got good numbers, they change them. Because the corporation allows customers to dictate when they want or don't want their engine, orders change daily. Since we can't bank any inventory, it is more difficult to respond to a schedule change. Communication must go on continuously between the assembly line, the coordinators, and the managers and be given to all team members. Just when you think you have communicated the right information, it changes.

The machining teams felt that JIT had been much easier to implement in A&T than it would be in machining, primarily because A&T was less machine-intensive. One team manager stated:

> A&T is basically just a people issue. Sure, they have a few torque wrenches to worry about, and they have to be concerned with their suppliers and their customers. But we have to worry about suppliers and our customers—A&T, Beacon, and overseas—plus 45 to 50 machines that can break down at any time. They tell us we have to have "planned downtime," but I don't see how that's possible. You can do all the preventive maintenance you want but sometimes a machine still breaks down, and you can't tell it to wait until the end of the shift.

In anticipation of JIT, the block line had reduced its end-of-the-line inventory to a four-hour level, a significant improvement since 1981, when there had been a minimum of one to two weeks' supply at the front end and one to two weeks of finished goods inventory. In addition, the conveyors between machines, plus the spurs, were full of in-process inventory—around 400 blocks (daily production averaged 20 blocks). By the end of 1985, the total block line inventory had been reduced to four-and-a-half days, though this was due more to volume increases than to inventory reduction. However, members of the block line team felt that further reductions were not feasible because of machine unreliability (frequent downtime ranged from 10 minutes to 10 hours), procurement of

many raw materials, such as castings from overseas, and lack of communication between the front and back of the line.

A major bottleneck came from an unreliable finishing machine. Operating at 100% efficiency it could produce 27 blocks per hour; realistically, a good day was 10 blocks per hour. When the machine was not operating for any length of time, blocks coming down the line would be taken off the conveyor and stacked near the machine so that the rest of the line could continue production. With a daily production requirement of 90 blocks, the team manager had introduced a split shift to staff the finishing operation 12 hours a day.

As blocks came off the end of the line, they were loaded onto skids, to be transferred to A&T or the UK facility.[4] The block line and A&T communicated in three ways: informal talks among team managers, daily production reports, and the material coordinator's poker chip system (every time the coordinator took a skid of blocks from the block line inventory, she would leave the poker chip on an inventory board to signal the need for further production). The block line, however, continued to produce to a monthly schedule when A&T had to shut down, unless A&T was down for more than a day; A&T could catch up by working overtime or working a little faster, but the block line was paced by its machine times.

Total Quality Systems

Along with JIT, SEP was implementing a three-year corporate program on total quality systems (TQS), which had been launched in October 1984. A corporate task force, including one member from SEP, had established 47 procedures, many of which concerned engineering, to be used throughout all functions and facilities. A primary manufacturing issue was total process control (TPC), which included statistical process control (SPC), training, maintenance, procedures, and equipment.

SPC was not new to SEP; it had been used in the block line since the line began operating in 1981. The line had achieved 90% of its goal of having all durability and safety characteristics on SPC by the end of 1986. Other areas of the plant, however, had a long way to go. The manager in charge of SEP's TQS efforts commented:

> Over the years, the plant got a little loosey-goosey on how things are done. A team might choose to change a procedure because it found an easier way to do an operation, but never document it. They might have thought they were buying a cheaper tool but were unaware of the total impact it might have on the product. The teams need to think differently about the process. Change must be controlled and evaluated. The operators may not know all—they aren't trained in engineering or don't know all about metallurgical properties. We also tend to reward firefighters and never measure fire fighting control. We need to think in a preventative way but don't know how to reward it. I expect we will have some problems as we implement SPC across all of SEP. We are taking away some flexibility the teams used to have.

Changes in Plant Leadership and Structure

During the early 1980s the plant went through several major realignments. Danney Goble, Gargarin's predecessor as SEP plant manager, had determined that the machinery businesses needed more common direction and established the position of director of machining, with responsibility for

[4] The UK plant required approximately 30 blocks per day; it was supposed to provide a firm three-week order, but that often changed weekly.

Businesses A, B, and C.[5] This position also inherited responsibility for other new machining businesses that were added to SEP, such as the block line in 1981–1982 and the rod line in 1983.

In May 1983, Goble stunned the plant by announcing he was leaving American Diesel to head up a small manufacturing firm on the out-skirts of Sedalia. One month later, he showed up at Gargarin's house with a bottle of champagne and informed Gargarin that he would be the third plant manager of SEP.

Gargarin, who had worked 19 years for American Diesel, joined SEP in 1979 as the director of A&T. According to Goble, at that time Gargarin was overly sensitive that his actions would "screw things up." For example, Gargarin recalled that when he needed to hire a new business manager, he had tried to involve a cross-section of that business in selecting a candidate. But he also had strong ideas about the kind of person he wanted and, as a consequence, had rejected the consensus candidate. Much gut-wrenching followed. Although he resumed the selection process and eventually got what he wanted, he felt he had mishandled the situation by not stating more clearly at the outset either what he wanted or what role the participative process would play.

As plant manager, Gargarin was considered less charismatic than his predecessors. Goble was treated like a hero when he returned for a visit several months after his departure, with employees noting that the plant had not been the same since he had left. Seeing that Gargarin was a bit taken aback by these remarks, Goble took him aside and said, "Don't worry about it. I went through the same thing when I took over from St. Clair."

Gargarin's style was quite different from those of his predecessors. Staff members described him as more soft-spoken, conservative, and procedure-oriented. Yet he made a special effort to attend weddings, confirmations, and funerals of employees' family members. When addressing personnel problems he tried to understand issues from other than a "cold business approach." Gargarin was concerned about his image and frustrated with people's perceptions that the more formal approach (increasing emphasis on process controls and cost savings) was a betrayal of the plant's original concepts. He knew he had to find ways to bring the whole system into a better "fit."

When Gargarin took over the plant's operation, he had five directors reporting to him: machining, assembly and test, finance, human resources, and reliability. In August 1984 he eliminated the position of director of machining because of head-count restrictions and a desire to link the business managers closer to the plant manager since the plant start-up had been completed. This, he felt, would also give recognition to the business manager level, something that had been a problem in the 1979–1980 period. Most managers, especially those within the machining businesses, were pleased with this move. But a few managers, and an external JIT consultant, were concerned that the machining businesses lacked a common vision. (**Exhibit 3** shows the organization chart as of December 1985.)

To strengthen internal communications, Gargarin continued to hold the "fireside chats" St. Clair had initiated and added monthly information meetings for team managers and non-exempt representatives from each team. Gargarin, however, believed that plantwide information meetings were inappropriate because of the plant's size and its pressing business constraints. As an alternative, he chose to restructure internal communications, making the business and team managers the key information link in an effort to strengthen their positions. This process was frustrating at times, for information could lose its meaning or comprehensiveness as it was passed down the hierarchy. And though some team members seemed to miss the meetings, he felt they also questioned the business need for plantwide gatherings.

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[5] SEP's teams were organized into five semi-autonomous "businesses." See "Sedalia Engine Plant (A)" for more in-formation.

Formal Governance Structures

Although Gargarin had made few changes in the formal governance systems, a consensus emerged that top-down decision making was more common. One team member commented:

> Most people feel that there is less involvement in decision making than there used to be. By the time team members get involved the decisions have already been made, and they are trying to convince you that it's the right decision. That's really more up-front than it used to be when they got you involved but led you through the participative process to come up with the decisions they wanted in the first place.

The Organizational Review Group (ORG), comprising the top 20 managers in the plant (business manager level and above), met regularly to discuss plantwide guidelines. Gargarin noted:

> I use ORG to get all the managers in the plant involved in decisions whenever there is something major which will affect the entire plant. I do believe, though, that many key business decisions should be raised and worked out in smaller groups like the plant operating team (POT) before being presented to the plant as a whole. ORG is a good vehicle for data gathering, but using it to set plant guidelines usually means six months of pain while the group wrestles with reaching a consensus.

The Board of Representatives (BOR) was also still active, but the group chose to meet less frequently than it had during the start-up years because it had fewer issues to confront. Exempt and nonexempt issues task groups, established during the early years, had atrophied. A proposal was underway to combine the three structures into a plantwide group called Board of Employees (BOE) (see **Exhibit 4** for details of the proposal).

Team Advisors Become Team Managers

ORG continued to wrestle with the selection criteria and training and development of team advisors. Although many team advisors felt they lacked authority to influence or manage their teams, Gargarin was convinced that they were a key element in SEP's success. Based on his encouragement, ORG decided in March 1985 to change the title to team manager. In addition, he rebuilt the Team Manager Forum (created by Goble) to focus on training and development issues. In a communication to all team managers, Gargarin stated:

- The Team Manager role has been the critical role in the success of this plant and will take on growing importance.
- This change does not imply a concept change. *It should not be construed as a shift toward more controlling management.*
- To the contrary, we believe that the most effective Team Managers will continue to delegate as much decision-making responsibility as the team is able to handle. The critical decision point is making the determination *what decisions teams are capable of and are prepared to make.* The fundamental premise of SEP, which is individual responsibilities within a team setting and directed toward goal attainment, remains our operational norm.
- The Team Manager retains *prime responsibility for his/her team's performance,* but this too is a responsibility delegated to the team. All team members hold responsibility for improvement.

- The Team Manager title more accurately describes what is expected. We expect team members to manage their work and Team Managers to manage the work of their team. "Advisor" has at times been misunderstood. Team Advisors have always been an integral part of the management of this plant, and the new title reflects this.

JIT had a strong impact on the A&T team manager role. Before the physical rearrangement, team managers in early 1985 had been reassigned so that one team manager had responsibility for teams 1, 2, and 3, another for teams 4 and 5, and a third for teams 6 and 7. Remaining team managers were assigned to JIT improvement projects. In addition, JIT implementation drastically changed the team managers' activities. Prior to JIT, they had spent only one hour a day on the assembly floor; the rest of their time was devoted to meetings or special projects. As of January 1, 1986, they were required to spend all of their time on the line—problem solving, filling in, leading repair work, and so on. Gargarin was concerned about this shift. While he recognized a need for constant team manager attention to the line during the start-up phase, he felt a better balance would be needed. In commenting about the change he noted, "Clearly the team manager needs more involvement and driving on the hour-to-hour issues."

Vertical Tasks

The continual tension between maximum team output and team member participation in vertical tasks intensified with the pressure to reduce costs. Initially, all team members were to rotate through all vertical tasks. Although no one could pinpoint a time or decision that signaled a change, most members of the SEP community believed that vertical tasks were deemphasized. In some cases, they were compressed and restructured to promote efficiency.

Piston Team Manager: There is less emphasis in the plant on vertical tasks because we no longer require all team members to hold all tasks. Also, with the downsizing that is occurring, there are fewer full-time vertical task assignments. This has reduced some of the pressures on the team members and pushed many of these tasks up to the team managers.

Support Team Manager: The concept used to be that everyone got into everything. With production pressures, that's changed a little at a time. Now if you want to be involved, you can be. Some people don't want to take on vertical tasks—I'd guess that only about 30% of the team members really want to take them on—and team managers don't feel any support to take those people off the job. An example of the production pressures took place last week when each team manager was required to hold a team meeting to review the annual operating plan. The block line held their meeting from 10 to 11 on Thursday morning, but at least 10 people couldn't attend because they had to keep the machines running. The team manager had to hold another meeting to give the same package to them.

Camshaft Team Manager: We're now down to 22 people [from 43] and need everyone on the machines. Many vertical tasks are now being done during lunch. Degree of team member involvement in vertical tasks varies a great deal by team. Generally, though, the veteran team members don't want to be assigned to vertical tasks. They say, "I did it, now it's your [newer team members] turn."

Piston Team Member: We used to talk directly with suppliers and customers and directly with people at the Beacon plant. No more. Now we just get information from our team manager. We used to have control over what we ordered, how we ordered it, whom we talked to, and how much we could produce. That's all gone now.

These ideas were echoed throughout the plant. One machining business manager noted that his area was not as heavily staffed on vertical tasks as it had been during the early days. Vertical task assignments were now limited to a full-time administrative team member who was responsible for receiving and shipping, a part-time safety representative, a full-time materials and incoming product inspection representative, and a few team members dedicated to quality checks.

JIT also reduced the time that team members could devote to vertical tasks. On the assembly line (with the exception of quality and materials, which were full-time tasks), vertical tasks became almost nonexistent. The finance representative assignment had dwindled, and training was done by the quality representative. The equipment representative, responsible primarily for preventive maintenance, spent all but two hours a day on other tasks.

The assembly line was balanced to allow for an hour and a half each day for vertical tasks and improvement efforts (a six-minute cycle with a daily production requirement of 60 engines). But by the fourth week of January, the line had finished early on only one day, with just 30 minutes to spare. Line start-ups at the beginning of the day and after breaks and lunch consumed much of the time designed for vertical tasks. Because team members were not accustomed to being at their workstations at the beginning of their shift, the line usually took at least a half hour to get started; 6 to 12 minutes (and sometimes 18 minutes) were lost at breaks and lunch start-ups. The equipment on the line had a capacity to manufacture up to 100 engines per day, and the design team planned to rebalance the line in increments of 10 as demand fluctuated. But if corporate pushed the plant to balance the line to maximize labor productivity, vertical tasks would have to be assigned to full-time support personnel. One manager noted that the trend toward more job specialization had already started.

Job Rotation

The emphasis on job rotation within teams had also lessened and shifted toward "controlled rotation" to build skills and control product integrity. Although a few mature teams had job rotation among all members, on average, machining team members performed about 30%–40% of the operations; A&T team members did about 60%—70% of the assembly operations within their team. With the growing pressure to eliminate all nonvalue-added tasks, several team managers were worried that training was considered too long a payoff item, that it had no immediate value to add to the product. According to one team member:

> They seem to be questioning the value of training, but then they go and say that some of us have to attend hydraulics training. I'm on a vertical task assignment right now and won't use the training for at least a year. It just doesn't make good business sense.

The practice of using group rather than team seniority to determine shift preference presented another problem. The camshaft team manager explained:

> In the camshaft team we have a number of different work groups, such as bearing and contour grinding. Group seniority (bearing versus contour), not team seniority, determines who ends up on second shift. If you take a first shift contour grinder and train him for the bearing area, he may resist being reassigned to the bearing area because he may have less seniority than the first shift bearing grinders and end up on second shift. This is pretty prevalent across the plant except in one-shift operations or where there is a small off-shift group. It's much easier to rotate people on the second shift.

Finally, there were tensions between functional organizations arising from the amount of rotation. The quality group felt that job rotation had a negative impact on quality and argued for little

or no rotation. The medical department preferred continual rotation (several times a day) to alleviate back and wrist injuries caused by heavy lifting and constant use of torque wrenches. In between were team members (particularly in A&T) who typically preferred rotating positions every few days.

Employment Security and Compensation

In June 1985 the corporate offices mandated a 10% across-the-board reduction in the exempt work force. SEP was forced to make its first-ever terminations: 18 white-collar professionals, including three team managers, were terminated. Although these people were marginal performers or had limited capacity for growth, their terminations had implications for future decisions on nonexempt reductions. First, the layoffs exacerbated an already high level of frustration and alienation among exempts; many thought the system was built more for nonexempts than for exempts. Most exempt employees felt less secure in their jobs than nonexempts, and compensation compression reinforced feelings of being treated differently. Second, the layoffs turned job security into the number one issue for nonexempt as well as exempt employees. Concern grew in December 1985 when American Diesel announced that it planned to close another nonunion, participative team concept satellite plant that had been opened in the South shortly before SEP opened. It was rumored that more than 100 nonexempts at SEP would be laid off in the first quarter of 1986. And, there was mistrust of the process by which the layoff decisions would be made. Many nonexempts were convinced that a decision had already been made and would be "sneakily" delivered.

Seeing the handwriting on the wall, Gargarin had asked POT to review SEP's reduction-in-force procedures and recommend revisions (see **Exhibit 5** for excerpts from the procedure). However, the human resources director was reluctant to make any changes in established policy:

> First, there is a matter of ethics and the fact that we have set people's expectations one way and should not change that at the last minute. Second, we are faced with a legal issue of implicit contracts. SEP has made an implicit contract over the years that we would go by seniority. If we as management choose to lay off by performance, we need formally to change and communicate the reduction guidelines. Third, I'm concerned about implications for the organization. If we change the system now, how do we get the teams to remain motivated to make further cost reductions in the face of pending layoffs?

Gargarin was also convinced that the link to Beacon's wage increases had to be cut, but he was worried about the timing, particularly with the pending layoffs. Because it was tied to the Beacon compensation system, nonexempt compensation at SEP was 30%–40% above that of the community. In addition, 60%–70% of the nonexempts were at the top of their pay scale, which meant they could receive a raise only through a cost-of-living adjustment.

Team members also voiced frustration that virtually no attention was being paid to individual performance. A senior team member noted:

> Pay raises occur automatically. Team managers seem either unwilling or unable to do much about the number of "loafers" in the plant and that number is growing. Punishment for nonperformance is virtually nonexistent.

A business manager also expressed his concern about the way the most talented people in the plant were being treated:

> The best performers have been hurt the most with the cutbacks. In the past, whenever someone was a good performer, he would be moved into an office or technical role in one of the support teams. That's an area that is being cut back by

50%. As these people are cut, there's no place for them to go and we end up losing the best talent in the plant.

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Gargarin was preoccupied with maintaining productivity and trust in the midst of these changes. He felt his biggest challenges were compensation, employment security, confusion about the team manager role, and JIT implementation. He also realized he could no longer avoid the issue of employment reductions. He believed he now had to decide on the method by which the compensation system would be changed, the number of people who would be terminated, the process by which they would be laid off, and the timing. He also had to communicate these decisions to the work force. Many SEP employees believed that people were literally working themselves out of a job. One business manager thought "widespread paranoia" was about to break out. A dozen employees had made inquiries to local unions, though they were unwilling to become active in a solicitation campaign. Their main concern appeared to be employment security, fueled by the corporate decision to close the Southern plant. Gargarin also believed that apprehension about changes in the level of nonexempt participation and compensation and benefits were adding to the unrest.

In early January, SEP's human resources director became plant manager at another satellite plant. To replace him, Gargarin hired a former colleague who had been both a team manager and an internal organizational development consultant at SEP before he left the company two years earlier. In describing his reasons for returning to SEP, the new human relations director stated:

> There are basically four reasons why I chose to return to SEP. First, I have a lot of respect for the leadership and ability of the people at the top of American Diesel. They are committed and take definitive actions. The second reason is the caliber of the people at SEP. They have strong values and a high level of capability and take an open, experimental approach to problems. Third, there is an extremely strong work force at SEP—the people are great. Finally, SEP is on the cutting edge of becoming a worldwide competitor, while still maintaining the values and commitment to the initial concept. I view it as a valuable learning experience and I want to be part of it.

Looking ahead to 1986, Gargarin concluded that stronger leadership within the plant would be necessary to manage the challenges facing SEP. He believed that one of the problems was that people did not know the limits within which they could participate:

> The plant needs to be more focused. I believe that you need to give employees the boxes, tell them their involvement in the box, and be clear on the parameters of the box. Some key areas which are outside team member control are compensation, employment security, goal setting, and manufacturing strategy. But, there are no limits on team involvement in communications and the improvement process. Currently the teams view this negatively and feel they are being restrained. We need to demonstrate that we are not taking away the most important elements of their involvement. I believe, though, that there is a need for team managers to move more towards a command role within the plant with more focus on cost, quality, and delivery and more streamlined decision making. At the same time, we need to keep the culture of SEP alive. The problem is how to do everything at once.

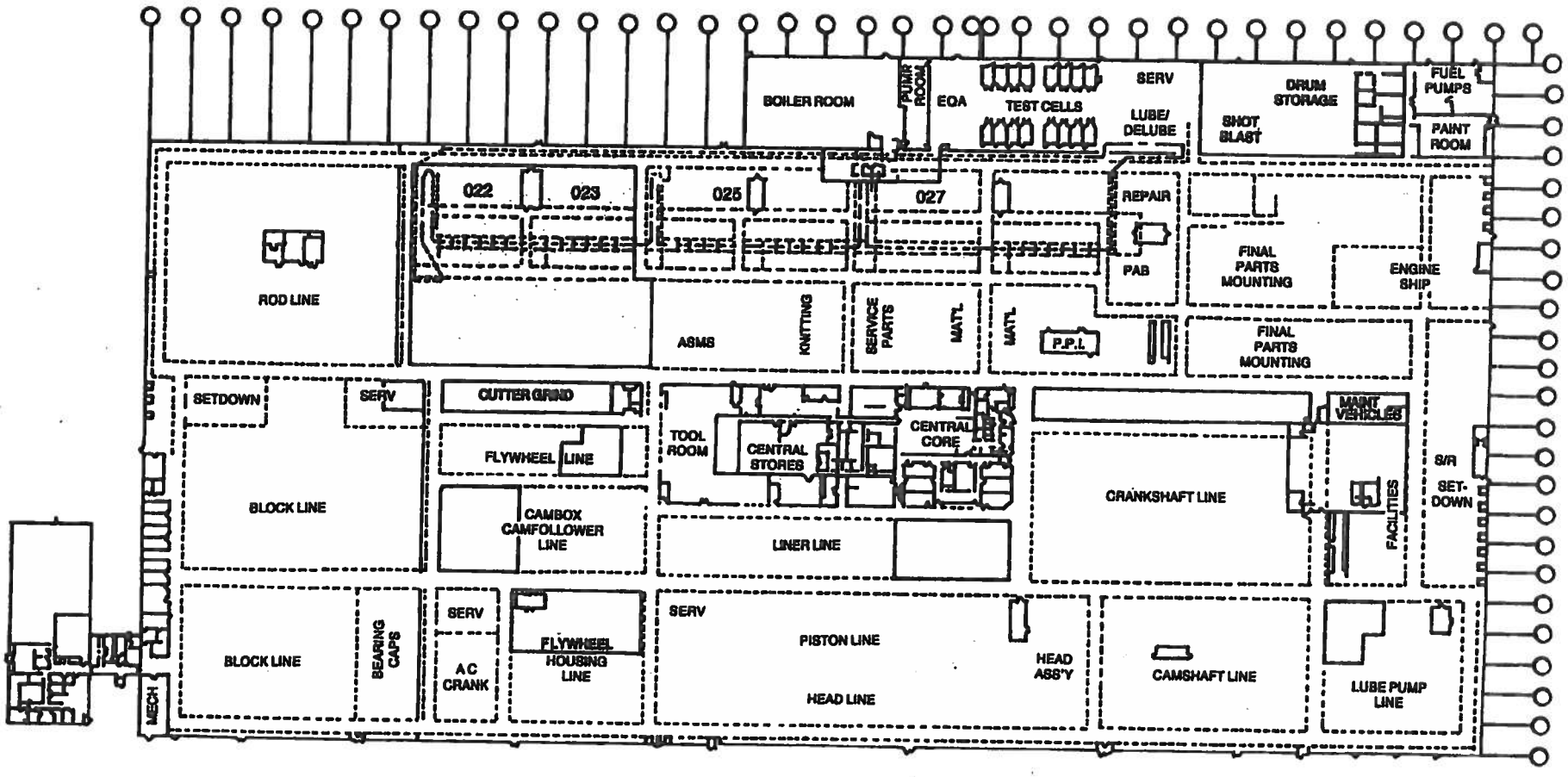
Exhibit 1 SEP Employment Statistics, 1975—1985

	Year-End Employment			Yearly Attrition (Number of employees)		OSHA Incident Rate
	Exempt	Nonexempt	Total	Exempt	Nonexempt	
1975	N.A.[a]	N.A.		1	–	N.A.
1976	75	68	143	3	2	7.4
1977	140	259	399	7	8	18.5
1978	138	413	551	12	25	13.9
1979	152	518	670	31	20	11.8
1980	155	527	682	16	15	9.9
1981	179	661	840	24	11	7.4
1982	180	631	811	15	17	9.1
1983	181	627	808	18	9	9.4
1984	175	741	916	23	21	9.1
1985	154	729	883	34	22	9.2

Note: Attendance as of year-end 1985 (on a rolling 12-month basis) equaled 97.6%. Although historical figures were not available, the personnel team manager had tracked the statistics from the inception of the plant and noted that there had been very little variation in the number.

a. N.A. means "not available."

Exhibit 2 SEP Layout, January 1986



KEY:

ALREADY IDENTIFIED NEW BUSINESS
AVAILABLE FOR NEW BUSINESS

Exhibit 3 SEP Organization, December 1985

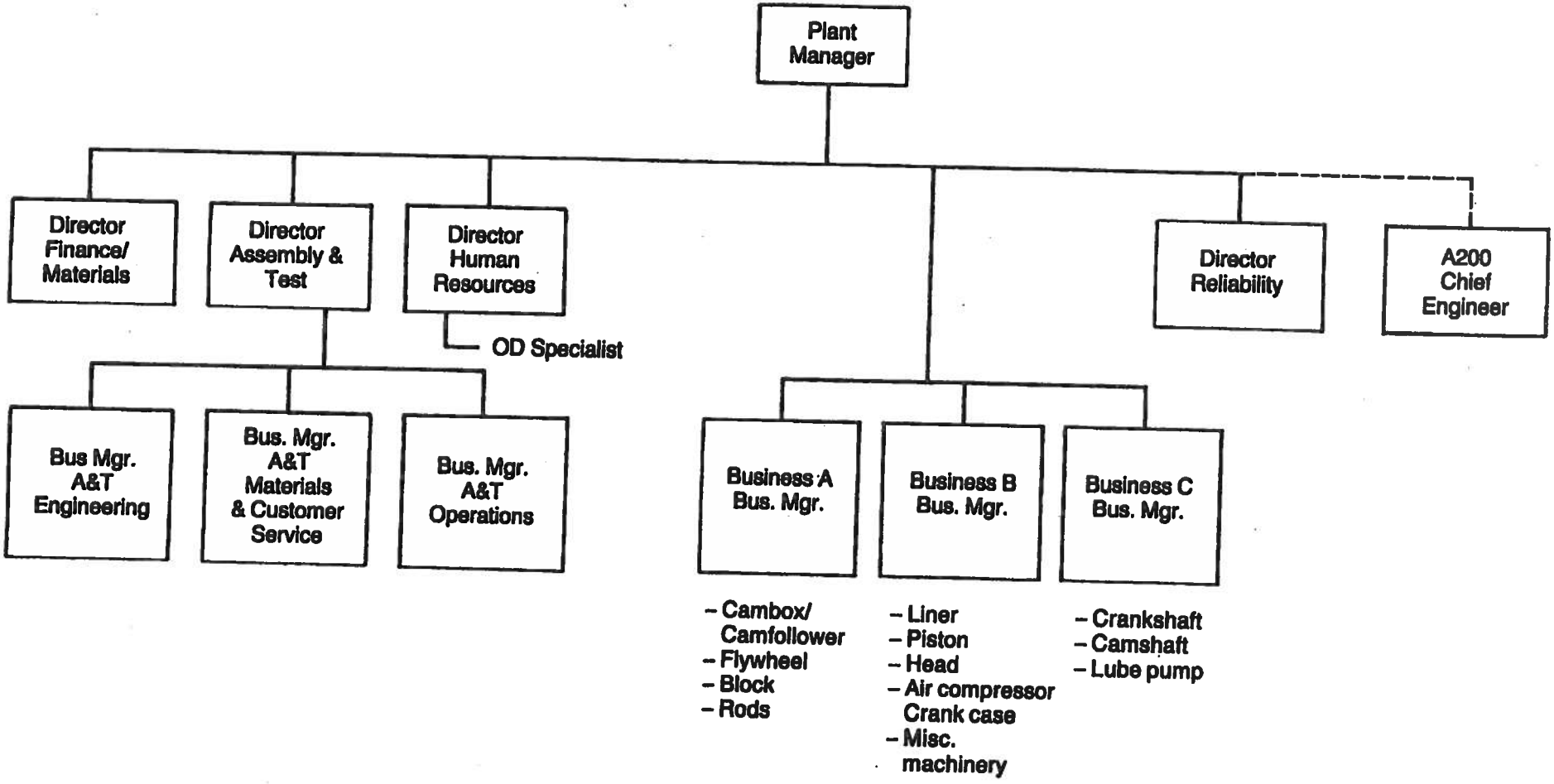


Exhibit 4 Memo Concerning Creation of BOE

Date: January 27, 1986
Subject: Logic/History BOE

In May of 1985, Joan Little of Organizational Development contacted the chairpersons of BOR, NEIG (non-exempt issues task group), & EITG (exempt issues task group) with an idea she had for streamlining the current plantwide groups. The logic developed for plantwide group consolidation came about based on the following:

- Too many people in too many groups and limited issues.
- A general need to review vertical task efficiency as we go to JIT/PULL.
- Fragmented/competitive efforts are occurring, i.e., issues handled by NEIG would be just as appropriate for BOR, and vice versa.

Current membership for BOR, NEIG, & EITG consists of 50 employees and 3 POT representatives. This represents 2,067 hours per year if each group meets for 1.5 hours biweekly. The proposed group would consist of 13 employees and 1 POT representative. This represents a significant reduction of hours, 2,067 to 507, and a savings of approximately $22,000 per year.

In November, information on this plantwide group consolidation was presented to BOR, NEIG, & EITG for input. Concerns and questions were brought back to the study group and discussed.

Recently the group consolidation proposal was presented to ORG. The presentation included a charter and guideline which ORG reviewed and supported.

A new name, BOE (Board of Employees), was chosen because it felt that "wiping the slate clean" and starting fresh would renew membership vigor and would lead to group effectiveness and efficient use of time.

In conclusion, it should be noted that this entire process has been an SEP employee-driven process. As stated earlier this has been an ongoing process since May of 1985, when Joan Little conceived the idea and contacted the chairpeople of BOR, NEIG, & EITG. The idea has been carried on by representatives of those groups. It is our hope that the employees of SEP will view this as objectively as possible and support the process.

Exhibit 5 Excerpts from Employment Stability and Work Reduction Guidelines, June 22, 1982

I. Employment Stability

Since beginning operations, the Sedalia Engine Plant has made and will continue to make every effort to provide long-term employment to all employees. This emphasis on employment stability is built on the premise that the plant must attract and retain a skilled and motivated work force, and that the employee who is constantly worried about his/her job security cannot give full attention to the job and perform the highest quality work.

The company considers many things in its day-to-day operations to maintain employment stability. Some specific examples are

- Develop flexibility in the work force through job design.
- Maintain a "lean" work force by avoiding overstaffing.
- Use temporary rather than permanent employees where appropriate.
- Buffer against a downturn through the use of overtime.
- Guard against future demand shifts by attempting to have a balanced product mix.
- Contract out certain of the more routine functions (i.e., security, office cleaning, etc.).
- Keep finished goods inventories and stocks at low level so that they can be built up in the event of a downturn.
- Build as much planning and lead time as possible into production schedules.
- Continue to develop and introduce new and improved production methods in order to operate the business successfully so that opportunities for employment can be maximized.

Such planning, however, cannot prevent a work reduction when business conditions become so unfavorable as to force a significant reduction in the demand for our product.

During a period of work reduction, the basic objective will be to retain as much of the skill base in the plant for as long as possible.

A work reduction represents an exceptional hardship for the plant and will require the support of everyone. We will need to work smarter, harder, and more cooperatively for as long as a work reduction lasts. *It should be remembered that a work reduction will be an emotional time and a time of worry. Trust in each other that actions taken are intended to be as fair and equitable as possible will be necessary.*

All employees will be kept informed of business conditions and plant circumstances requiring a reduction in employment. Communications will include Corporate conditions, plantwide impact, the duration of a work reduction (if known), a review of major policy steps involved, and a date when the work reduction will go into effect.

(continued on next page)

Exhibit 5 (Continued)

II. Work Reduction Sequence

In the event that business conditions require a reduction in work force, every attempt will be made to make this process as fair and equitable as possible to all employees within the constraints of plant production requirements. It is our intent that as many methods of providing employment as possible will be utilized. These will include the following actions which will generally be implemented in sequence unless severe business conditions require bypassing some steps:

1. Eliminate overtime where possible.

2. Encourage people to take voluntary temporary layoffs (VTL). Less than one month VTLs may be taken in conjunction with remaining unused vacation to total one month.

3. Eliminate temporary hires.

4. Redeploy people by using a plantwide swing team to offset overtime and to perform plant facilities upkeep, maintenance, and support projects.

5. Redeploy people by using a plantwide swing team to take over a portion of the contract services (Janitorial, Security, Reception, etc.).

6. Implement a shared work reduction (fewer hours/reduced salary).

Only after taking the above steps, and if a further reduction in hours to be worked becomes necessary, will layoffs be considered. Plantwide meetings (such as BOR, etc.), training, and orientation will be continued. These are important functions and may possibly become more important during a period of work reduction.

If a work reduction cannot be managed without a layoff, persons from the Office and Factory category will be designated for layoff first by lowest skill level and secondly by length of service within a skill level. If a layoff decision must be made among two or more employees who are at the same skill level and with the same length of service within that skill level, the decision will be made by lottery. It is intended to give at least one week's notice to those designated for layoff.