AREA REP REPORT

Capacity, technology guide Forest Grove project

TEK'S FOREST GROVE building, rear, is near Neil Armstrong Junior High.

MIKE BRAND
Conference Speaker

Mike Brand, Manager Electrical/Mechanical Component Manufacturing

We are building a new circuit board plant at Forest Grove for two reasons: capacity and technology. Several years ago it was recognized that we were soon going to be out of capacity to meet Tektronix needs for circuit boards.

It was also recognized that there would not be enough qualified capacity outside the company to meet our needs. In addition, there was a growing awareness that we had fallen behind the state-of-the-art in circuit boards and this was hurting our product designers.

As a consequence, a project team was put together under the direction of a project manager supplied by the A. T. Kearney Co. This work led to a proposal to the Tektronix Board of Directors in February, 1981. They approved and we went ahead with the program, breaking ground in August, 1981. Construction time was planned to take maximum advantage of the weather and also allow time for competitive bids.

There are some differences about this project:

First, we hired a professional project manager for the proposal stage rather than asking someone who was already too busy to add this to their schedule.

Second, Board approval was based on a favorable return on investment study as well as meeting technology and capacity needs.

Third, after Board approval, we changed the membership of the project team from planners to doers.

Fourth, we hired a project manager, Gene Hendrickson, who would also become the manager of the plant when it was built.

Fifth, from the beginning this program has been the responsibility of the operating managers.

Collaboration with facilities has been excellent, with special mention of David Lintz and George Sturm. We feel they have done an outstanding job on this project. All final decisions, however, are made by Gene or myself and no changes are permitted without Gene's or my agreement.

In building this plant, we are basically putting a skin around a process. The building itself, with outer walls of pre-formed concrete, covers an area the size of four football fields. The roof is now in place, and workers are concentrating on inside utilities, some of which are extremely complex.

Circuit boards are very fundamental to today's instruments. Each one is unique—that is, designed for a special purpose. They are like an electronic skeleton, in that they electrically connect the various functioning parts of a product. Sometimes they are also a part of the physical structure as well.

Circuit boards come in all shapes and sizes. They are simple or complex, two-sided or multi-layer. In its most basic form, we start with a copper-clad laminate, impress an image by either screening or photographic techniques, then etch away the un-needed copper leaving a circuit pattern.

One of the areas we fell technically behind in was the ability to do fine line work. Fine line means run widths

below 10 mils. Our current operation can put one run between the pins of an IC, 7 mils allows two runs, 5 mils line width allows three runs.

Fine line allows designers to work with fewer layers and put far more circuitry on a given board.

Other areas in which we fell behind involve equipment and process control that leads to lower costs and higher quality. Forest Grove is designed to correct these shortcomings.

The mission of the Forest Grove operation is to be the best high technology circuit board manufacturing plant in the world for cost and quality. The purpose, of course, is to provide competitive advantage to our products. To understand what we are doing at Forest Grove, we need to think in terms of the value adding process.

Everything we do can be thought of in terms of an input, a transform and an output (see chart). Notice that the things that matter both at the input and the output are the same—cost, quality, service and effectiveness in use. Whether considering a single person job, a department or a whole plant, the same conceptual thinking applies.

The "transform," that is, your operation, or in this case Forest Grove, needs to be accomplished in the most effective manner possible. The inputs have to be in alignment with the transform.

Notice the outputs also have to be in alignment with the customer and his requirements, however, this means you have to really understand the customer's business and what his outputs have to be in order to be successful.

To carry this to the strategic level, you also have to know what your competition is doing; that is, how well they are able to meet the needs of our customer.

Keeping the value added ideas in mind, the input to Forest Grove is from our vendors. We propose to deal with only one vendor rather than several for each type of material or equipment. The vendor selection is rigorous and includes support, quality, R&D capability, and delivery as well as cost.

Furthermore, all material vendors are expected to provide material on consignment. This means we pay for it only after we have used it. The "vendor of choice" relationship makes them almost an extension of our company. We will continue to monitor other vendors' capability, however, so that any vendor who fails to meet performance expectations can be replaced by a better vendor.

The capacity of Forest Grove is approximately 1.6 million square feet of laminate per year, about three times our current requirements. We will open with two shifts and go to a third when it becomes necessary.

Forest Grove will operate as much as possible as an independent operation with all functions reporting to the plant manager. Production is organized into six business elements.

Costs will be estimated and tracked for each run. All operators will become certified on all the equipment in their business elements.

Gene Hendrickson puts it well when he says these operators will not be processing circuit boards, they will be managing the process by which we make circuit boards.

We expect to hit the ground running at Forest Grove and be able to show continuous improvement in cost, quality, service and effectiveness in use as long as the plant exists.

The project team of technical experts, who come from both inside and outside the company, have selected the best equipment and processes they can find anywhere. In fact, most of the equipment comes from Europe. European equipment is far superior to either U.S. or Japanese designs.

Forest Grove is an exciting project, and it will be an exciting place to work. I'm keeping my fingers crossed, but so far we are under budget and ahead of schedule. At the same time, we've got a lot of circuit boards to build out of Bulding 38 between now and next January.

Questions from the floor for Mike Brand

How do we choose our vendors at the Forest Grove site?

We don't just look at cost, which is the traditional method. Rather we get a proposal from a vendor that says they can meet our quality standards, and our cost requirement. We also require that they have a strong commitment to research and development (R&D), and that they can provide training and technical support. There is a list of about nine or ten things a potential vendor must discuss in a proposal.

What we typically do is start with a number of vendors and narrow it down to two or three. Then our technical people will go visit those plants. We find that sometimes vendors do a very good proposal on paper, but when you go see their plant it's a different story.

Do we have a way to keep a quality check and state-of-the-art check on these vendors once we've started with one?

Yes we do. Our relationship with the vendor is conditional, based on certain requirements. We stay with our chosen vendor until we find somebody better. In fact we don't stop talking to other vendors once we've chosen one. If the vendor we have chosen falters in the slightest there is a competitor waiting right there to take their place. It's a dynamic situation; our vendors have to continue to improve, just as we expect ourselves to continue to improve, or we'll replace them.

Will the automatic plating material be owned by the vendor or by Tektronix?

We will own most of the equipment that is installed. What we won't own are the things that are consumed in the process.

How often do you find vendors unwilling to go with these techniques?

To my knowledge there have been very few. Most vendors have looked on it as an opportunity. They would like to work in that kind of a relationship. There hasn't been any problem getting willing vendors.

Questions on Agenda

Can you give some examples of what will be more automated in Forest Grove?

(Gene Hendrickson) The drilling processes will be more automated to take set-up time out of the process and enable the operator to be ready to drill very quickly.

The plating equipment is completely computer controlled and program variable. It includes a complete material handling system that is also under control of the computer.

Those are a couple of examples. We have automated almost every process where you typically see operators putting boards in machines and then taking them out and stacking them. That will all be done with automatic material handling systems. Most all the processes and material handling systems have been automated through computerization.

What will you do with the old equipment?

Some of it will be moved to Forest Grove. Part will be used by the engineering line and some of it will be sold.

Do you have to reapply for your job if you are part of the scheduling group and it's going to Forest Grove?

Yes.

Do you mean you have to reapply for a job you're already working?

When you go to this kind of system there aren't always the same number of jobs. If we bring MAS II up ahead of time and we work it out with the Howell system it's very likely that we may not only have a different kind of scheduling job, but not as many. We're trying to treat the whole operation in the same way. Thus scheduling will be treated the same as all other jobs at Forest Grove. We're investing a lot of money and want to see that it pays off. As I said earlier, we want to be sure that everyone who goes to Forest Grove is qualified and wants to be there.

When you talk about zero material inventory, are you talking about having little on hand or the fact that you don't pay for it until it's used?

Both. In the first place we would set up on either daily, weekly or monthly deliveries so that there is never very much on the premises, as well as not owning it until we've used it.

Are you going to have special stock areas?

We want to have as little as possible. If we find that a special stock of a few things are required and makes good business sense and keeps the energy use at the lowest, then we would do that.

If this vendor concept works, would you see it extended to other areas in the company?

I would go further and say the vendor concept does work, and, yes, we certainly expect to extend it to other component plants and I would expect other areas of the company to look at it and see if that would work for them.

If in moving from here to Forest Grove you can't find placement for all the employees who are not moving, will they be laid off?

No. A layoff is not an option.

What are the plans for training, and while we're in training who is going to do our job in Building 38?

The training will be in addition to doing the job in 38. We'll have to do both. We don't have the luxury of doing it separately.

Regarding the vendor consignment: You indicated that vendors really like consigning things, but what business advantage does it have for them?

There are a number of advantages. If you're the vendor of choice you have a sure

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steady business. You also have a certain advantage having been the vendor of choice to Tektronix. Other potential customers, within the industry, know the kind of rigor by which we're choosing vendors. A lot of times people underrate the value of being a key vendor for this company. We're known to be very tough on quality, and to want the best.

Plus, we're really not talking about tying up that much of their money by going with this consignment system because we allow them to deliver to us on fairly quick terms. Doing business with Tek has to look awfully good to them.

Could you elaborate on what kinds of jobs technicians could find at Forest Grove?

(Gene Hendrickson) I think there will be some opportunities in maintenance, both mechanical and electrical. They will be posted in the job postings. There is a lot of interviewing going on now so I don't know how many of those positions will be available, but at the moment those are the only ones that I am aware of.

Does Tek offer any classes having to do with the functions that will be performed at Forest Grove?

There is a lot of training of current operators going on in the circuit board area today. I don't believe there are any in the general education and training area.

If someone was interested in a job in that area, how would they go about getting the proper training?

(Gene Hendrickson) The jobs that are posted in Tek's job posting will be specific. For example, if screen printing is an area where we have openings, and you apply, then during the interview process it will be explained to you what the job entails. If you are offered the job you will be given very thorough and in-depth training in those processes.

What kinds of jobs will be available in engineering?

(Gene Hendrickson) The engineering support groups are being segmented into the different business elements. We will have on first and second shift a support engineer in each of those business elements. The engineering jobs that you see posted will be also process specific. Each posting will explain what skill requirements we're looking for in those jobs.

After the Circuit Board Manufacturing moves out of Building 38 will there be any remodeling done to the building?

Yes, the whole north end of that building, which is panel plating and chem mill, stays in that building. We do plan to "revive" 38. Those of you who work there know that we have that building in overdrive. We're putting through about four times the load it was designed for. The aim is to put that building back in good shape for panels plating and chem mill as well as component engineering functions.

Will circuit boards be "loaded" at Forest Grove?

We will make just the raw circuit boards. Boards will not be stuffed with components at Forest Grove. Currently that is done in the Koll Center and probably over time that will become part of divisional operations. But I would expect that will take some time to work out.

How will using 5 mils match us with the competition?

It will put us ahead of most of the competition; we will be ahead of our direct competition in the instrument business.

Will you ever sell boards to other companies?

Current plans are not to. It would be possible if the company chose to do that.

When do you plan to catch up and fill all the raw board shortages?

We are using almost all of the available qualified capacity in the U.S. outside Tektronix today. The main reason for shortage isn't so much capacity as it is problems with our scheduling system. We're trying very hard to improve the system now rather than waiting for MAS II.

What percentage of the inserted boards are from outside vendors now?

We are subcontracting today about 30 per cent of our load. We won't ever let that go to zero because we want to keep in contact with the "good" outside vendors.

Agenda questions on the Forest Grove project

(Answers by Mike Brand)

What is the Forest Grove operation?

The Forest Grove operation is a single plant designed to meet Tektronix' need for circuit boards for the next five years.

What are some of the goals at Forest Grove and how will they affect Tektronix as a whole?

The goal of our Forest Grove operation is to be the world leader in high technology circuit board manufacture. Achieving this goal will provide a major competitive advantage to Tektronix product groups.

Will we be able to have a tour of the building at Forest Grove on, before, or after the opening of that new plant; and are we going to be briefed on how this (the Forest Grove plant) will affect the company as a whole?

We will not be providing tours of the building at Forest Grove prior to its opening. Once operating, partial tours would be available to Tek employees. Some areas are not tourable due to the nature of the processes involved. Hopefully, this Area Rep meeting will help explain the effect of Forest Grove on the company as a whole.

Where in Forest Grove is the new plant located.

As you approach Forest Grove from the east, on Highway 8, turn left at the first light, on the road that goes to Highway 47. The plant is in a large field on the left.

When will Forest Grove start up operations?

Forest Grove will begin operations in January, 1983.

How much is the Forest Grove project costing the company?

The total Forest Grove project—including building, equipment, training and moving—will cost something over $30 million. To date, we are below budget and slightly ahead of schedule.

Why did Tektronix not utilize in-house resources for the design and operation of the Forest Grove manufacturing facility when those resources are available?

Tektronix facilities people have directed and coordinated all design work done on F-1 in conjunction with the project team. We really don't have inside resources for this kind of design. The operation of F-1 will mainly be accomplished by managers and operators from our current ECB operations.

How long will we be agreeing to stay at Forest Grove before looking for another job?

Forest Grove is no different than other Tek locations. Those that accept jobs at Forest Grove will be subject to the current policy which is that people stay on the job before looking for a change for a minimum of 6 months for Range 9 or below and 12 months for Range 10 and above.

Does this mean more job opportunities and new hires?

We have hired a few people from outside with special skills, but the majority of managers and operators for Forest Grove are coming from our present operation. Over time, as F-1 expands its capacity, I'm sure there will be increased job opportunities.

How many people will there be at the Forest Grove site?

We expect to open Forest Grove with about 275 people.

When this new facility opens, will people working at Tek simply be transferred over or will this mean an open job market for those in unemployment lines? If so, how many jobs would you estimate for "outsiders?"

If a person lives in the Forest Grove area and wished to transfer, will they be given first chance?

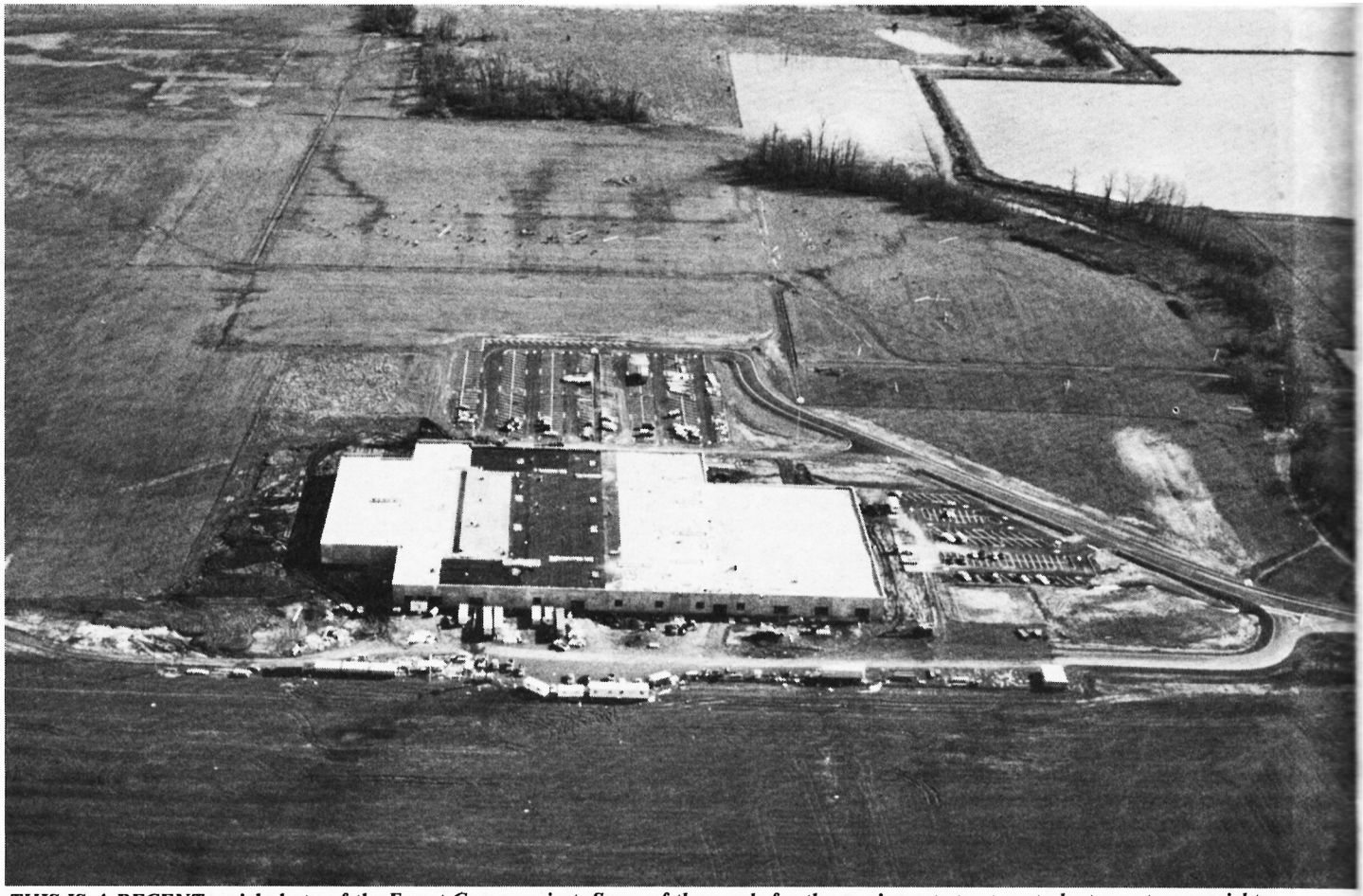
Will it depend upon your qualifications for a job at F-1, or will living so close to F-1 help in getting on out there?

I am interested in working at the Forest Grove plant but am not familiar with positions available or qualifications—is there someone who can provide me with this information?

Are there classes or training offered for opening positions or will a person be trained on the job?

The current ECB operation has about 550 people (this number will be 660 at 301). The Forest Grove operation will start with considerably fewer. The management positions for Forest Grove have been selected, mostly from current ECB management and the project team.

Selection is currently going on for about 240 operators from a population of 290 existing operators who have chosen to apply for Forest Grove. Extensive training will be going on for all ECB people between now and next January.



THIS IS A RECENT aerial photo of the Forest Grove project. Some of the ponds for the area's waste treatment plant are at upper right.

Although there will probably be few openings to start with, I'm sure that over time, attrition and expansion will lead to more job opportunities at Forest Grove. Any jobs not filled from the current ECB group will be posted in the normal manner.

People who are interested either now or at a later date should let that be known to Tony Perry (Personnel Administrator), Beaverton ext. 0358, del. sta. 38-330.

Will there be a possibility of some sort of mass transit or shuttle from the Beaverton plant to Forest Grove?

Beaverton Tek employees moving to Clark County are getting $1,000 for moving or relocating. Does this mean we will get the same consideration, moving to Forest Grove?

Depending on need, we probably will run shuttle buses to Forest Grove for a period of time after opening. There are no plans for special travel compensation for the move. We will be talking with Tri-Met in hopes of gaining bus service to the Forest Grove plant.

Will the move to Forest Grove be a complete move of the operations in 38 or will it be an additional facility to 38?

Will Forest Grove produce other things besides circuit boards; i.e., chem milling, silk screening—the other things 38 does now?

All of the production ECB operations will move to Forest Grove. (Forest Grove will only produce circuit boards.) The Panels, Plating and Chemical Milling portion of Metals will remain in Building 38.

Will Forest Grove manufacture circuit boards for other companies, or will it be just for Tek products?

At the present time, we have no plans to manufacture circuit boards for anyone but Tek at Forest Grove.

What is ECB going to do to assure smooth and continuous supply of circuit boards while the facility is moving to Forest Grove?

Forest Grove will be fully operating and checked out before we ever move there. Training has already begun and will continue for the next 10 months. We plan to build ahead at 38 before the move and we will probably continue to operate some portions of ECB at 38 for a few months after the move. Our goal is to make the move with no loss of supply to our customers.

Are you going to OK a $5,000 ventilation system in the Image clean room or are we going to continue to produce bad circuit boards till F-1?

We have no intention of producing bad circuit boards from any facility. We will continue to make improvements in the Building 38 operations right up until we move to F-1, including the ventilation system. We have a lot of good circuit boards to produce out of Building 38 between now and next January.

Circuit board shortages are a serious problem for most assembly areas. Since you anticipate solving the majority of the problems in mid-1983, what is being done now to alleviate the hardships these shortages are creating today?

Some divisions are looking for another vendor to purchase ECBs. If they are successful, won't this impact the utilization of the new facility?

Circuit board shortages, as with all shortages, are a serious problem for assembly areas. We have no intention of waiting until mid-1983, or any other time, to relieve these problems. We are all, both product divisions and component plants, living with a system that tends to create shortages. There is a task group, made up of the material managers of the product divisions and components plants, currently working on the transition from where we are to the implementation of the MAS II MRP system.