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July 26, 1974

Subject: Monitoring Report #1

Project: Satellite (MP)

Burgess-Norton Mfg. Co.
Geneva, Illinois

RJS Project: 74:43

Date of Monitoring: July 22, 1974 (working day 142)

Monitored from Issue #1 dated June 10, 1974 (working day 113) ✓

Revised 8/22/74

Actions taken:

- Reviewed project progress with Mr. Rasmussen, Mr. Hazelwood and Mr. Nyman
- Began preparing level 2 (detailed) networks from summary diagram 8/22/74
- Evaluated project progress

Program & graphics not done. Will be done 9/31/74 (176) 145 (27)

As of July 22, 1974 (working day 142) the project is 5 to 10 working days behind late start/late finish dates measured by the Issue #1 network dated June 10, 1974. Lagging items are preparation of graphics and completion of the facility program for presentation to local corporate officers; and provision of approval for the Geneva expansion from corporate headquarters. Potentially lagging is completion of an evaluation of the screw machine shop acquisition. Still in process

It appears that the lag in the preparation and presentation of the project graphics and program for the Satellite facility may increase since the plan probably will have to be acted upon by the parent corporation board of directors and thus, has to be timed to coincide with their monthly meetings. Mr. Rasmussen is presently reviewing the approval procedures and we will diagram these in subsequent planning meetings.

Now 44 wd. for corporate approval

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It should be remembered that time lost early in a project is oftentimes very difficult to recapture. Normally early loss of time tends to slow the pace and makes it difficult to again regain full momentum. Therefore, I suggest project activity in this early period be continuously maintained at a high level and moved as aggressively as possible.

Part of our discussion centered around the new site and used building search. The plant location consultants will begin their active work immediately and I urge that close communications be maintained between Burgess-Norton and the consultant so that the company search and evaluation for usable existing buildings can be focused on those regions, areas and communities that the consultant finds suitable for construction of new plants. Chances are that whether the satellite is a new or existing facility, the required locational characteristics will be somewhat similar. A meeting is to be held on August 8, 1974 (working day 155) to completely discuss the current status of the location consultants' work and procedure.

In reviewing the networks, there are several areas that would be desirable to plan in more detail. These include the following:

- Remodeling the Geneva facility
- Preparation, presentation, reworking and final approval of the project program and proposal
- Interfacing the site selection work with the internal planning operations
- Planning the recruitment, training and community relations activities
- Design, construction, turnover and occupancy of the new facility
- Installation and activation of equipment in the new facility

finish.

In subsequent meetings it would be appropriate to discuss these items in detail and prepare comprehensive network plans for each.

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Geneva Remodeling

As part of our work at this session, we began a detailed review of the Geneva expansion program beginning at node 35 (the 1 node of tentative order long lead time equipment) on sheet P1 of the Issue #1 network diagram dated June 10, 1974.

First we prepared a plan of the moves required to occupy areas 1, 2 and 3, (as defined on sheet 2 of the Geneva remodeling diagram dated July 22, 1974. This series of moves deals with provision of additional steel storage space and manufacturing room. We then took an overlook at the entire Geneva remodeling and isolated all long lead time equipment that is either ordered or to be ordered for this work. The process was planned in adequate detail so that day to day evaluations can be made of the progress in obtaining this equipment. The plan is shown on sheet 1 of the Geneva remodeling network dated July 22, 1974. The third work area was to establish a plan of procedure for remodeling areas 6, 7, 8 and 9. Two plans were prepared. The first assuming that equipment would be moved only once as noted in plan Z. The other was based on a double move of equipment into a more desirable location indicated by plan A. In plan A vacation of the existing office area of the plant is required into the new office building and the interior of the existing plant office would then be remodeled for the permanent relocation of the equipment. The advantages and disadvantages of each of the two plans will be evaluated and a selection made in the near future. It was not totally possible with the present information available to make a choice at this meeting.

One of the more important steps in the Geneva remodeling is to make strong efforts to establish target completion dates on each phase of the remodeling and expansion. Since oftentimes these dates are set somewhat arbitrarily by influences that are occasionally outside the control of Burgess-Norton, it becomes critical to continuously pinpoint areas which must be influenced by Burgess-Norton. This means essentially that the situations which concern turnover points for various sections of the remodeling must be managed rather than managing. We went over this technique in brief at our meeting but it should be covered in more detail at subsequent sessions. Essentially the plans of

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actions we are preparing should be used to establish goals for all parties concerned in the program. Thus, they will be encouraged to use the plans as a management by exception tool. The use of the system as described above is part of the control and correction techniques we should be focusing on in subsequent conferences.

I covered a few of these control techniques including the use of the isoquant lines and very briefly the cost curve system at our July 22nd meeting. However, these should be presented in more detail before extensive use is made of them.

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RJS
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To: Mr. Warren Rasmussen
(orig. & 2 copies)

RALPH J. STEPHENSON, P.E.
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August 31, 1974

Subject: Monitoring Report #2

Satellite and Geneva Remodeling (MP)

Burgess Norton Manufacturing Company
Geneva, Illinois

RJS Project: 74:43

Date of Monitoring: August 26, 1974 (working day 167)

Monitored from Issue #2 dated August 22, 1974 for Satellite, and updated networks, Issue #2 dated August 26, 1974 for the Geneva remodeling

Actions taken:

- Reviewed project progress with Mr. Rasmussen, Mr. Hazelwood and Mr. Nyman
- Reviewed level 2 diagrams for Geneva expansion
- Discussed additional translation and monitoring techniques
- Evaluated project progress

Satellite

Presently the Satellite project lags the Issue #2 network by approximately 27 working days, still in completion of project program and graphics. The cost accounting study is just now nearing completion and should be ready for review on or before September 3, 1974 (working day 172). Hopefully the approval and revision time following preparation of the project program and graphics can be cut so that the approval two process is initiated with Amsted about September 9, 1974 (working day 176). This would bring the early part of the project substantially back in line with our original projection.

However, it is now considered possible that the corporate review might take as much as two months covering two Board meetings.

Therefore, we have allowed a 44 working day (two month) period for presenting and approving by Amsted. Mr. Nyman has reduced some equipment delivery dates later in the project to take care of this increased approval period in the hope of being able to maintain our original target dates. At our next monitoring we shall be in a better position to evaluate this approval period allocation and to discuss in greater detail the site selection and design process.

Geneva Remodeling

This session was devoted to establishing definitive targets based upon five priority assignments. In line with earlier recommendations we isolated functional groupings of moves and gave each a priority rating. These priorities are as follows:

Priority 1

Moving Tunco out to other areas and occupying areas 4 and 10 with maintenance and area 11 with the new Holcroft furnace.

Priority 2

Shifting areas 15, 16, 17 and 18 to accommodate a new grinder line in conjunction with vacating and reoccupying areas 1, 2 and 6.

Priority 3

Installation of a new phosphate plating line.

Priority 4

Vacation and reoccupation of areas 3, 5 and 7.

Priority 5

Remodeling of areas 8 and 9.

(Note: These areas are as defined on drawing #6 dated August 26, 1974.)

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Each of the priority moves was diagrammed in detail with overall key delivery items shown on sheet #1.

Looking at each priority in detail, we find the following:

Priority 1

The determinate date to which priority 1 work must be aimed is delivery of the new Holcroft furnace, now scheduled to be at the plant on February 13, 1974 (working day 286). Most critical to preparing the area for receipt of this furnace is the vacation of areas 4 and 10 by Tunco so trench work and mechanical and electrical installation can proceed for relocation of the tumbling barrels. Next will be installation of the pit and the adjoining electrical and mechanical work for the Holcroft furnace. As an integral part of this, the tumbling equipment must be relocated before removing maintenance from area 11 to area 4 and area 10. Thus, the critical sequence deals with vacating the Tunco space, shifting tumbling equipment and the move of maintenance, followed by installation of the new furnace. Presently if we assume that the furnace will be on the job February 13, 1974 (working day 286), our present plans show that Tunco must vacate the space they presently occupy on or before October 28, 1974 (working day 211). This will allow 75 working days or about three and a half months to prepare for the furnace arrival. This is a very high priority move since the furnace is a sizable piece of equipment and if our present delivery date holds, the plant must be ready to receive it when it arrives.

Priority 2

The major thrust of the priority 2 work is to get the new grinder line #7 in operation. Presently, depending upon the procurement of spindles, it appears that we could have this line installed by about October 21, 1974 (working day 206). The grinders are due in on October 7, 1974 (working day 196). Critical items include removing the existing brazing furnaces, shifting steel storage, and preparing area 15 to receive the new line. Thus, it becomes important to expedite removal of the existing brazing furnaces.

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Priority 3

Priority 3 work probably extends furthest into next year since it depends upon a very long lead time item - delivery of the coating equipment. This is due to arrive on June 11, 1975 (working day 369). When it arrives, area 12 should be ready to receive it. There appears to be adequate lead time available for this preparation work. It is not anticipated that in-plant remodeling will hold up installation of the equipment.

Priority 4

Priority 4 is concerned with installation of selected equipment in area #3 along with a transport system. It appears presently that the priority 4 work can be completed by November 19, 1974 (working day 227). This date is tentative, subject to further evaluation.

Priority 5

Work in priority 5 starts after occupancy of the new office building. At that time, the present office area in the manufacturing plant will be converted to plant space to house screw machines and automatic chuckers. The plant space released by this move will be reoccupied by equipment from the grinding room. This move involves area 9, 8, 6, 13 and 14. We were not able to review this sequence of moves in detail at the current planning session but Mr. Nyman will redo the logic where required and incorporate it in the updated drawings.

General Summary

Overall, the Satellite program is running somewhat behind in preparation of the program and the cost analysis. However, it is hoped by dovetailing local approvals and revisions required by these local approvals that we can still meet the target Board submission date of September 9, 1974. Board approval is expected to take longer than originally anticipated. However, an improvement in delivery times on long lead time equipment could recapture this loss.

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So far as the Geneva remodeling is concerned, the program is now relatively well planned with target dates established for review and approval. The work accomplished in this planning session will be reflected in a new set of network drawings to be issued by Mr. Nyman.

In reviewing the work load expected on the Satellite program and on the Geneva remodeling, I anticipate it is going to require considerable full time attention from competent staff personnel. The buildup in responsibilities is just starting and as the tasks overlay each other for the two major projects - the Satellite and the remodeling - there will be a strong need for technical attention of a continuous nature. It is entirely possible that Mr. Nyman will require technical assistance as well as working space in which to graphically prepare the necessary planning, translation and control documentation. This matter should be given early consideration.

As a part of our work today, we also reviewed the resource allocation technique using bar charts. I suggest that each of the five priority moves be analyzed using this technique with a master resource requirement tabulation made and identified. I also suggest that short staff meetings be held at regular intervals to review work to be done in the next time period. Presently it appears that it would be wise to concentrate each week on those activities which are expected to be started, maintained in work or completed over the succeeding two week or ten working day period. We reviewed some of the graphic techniques available to do this and a selection of which to use will be made soon. In addition, I recommend that a full set of current color coded networks be displayed each meeting to identify the qualitative characteristics of job progress over the past period.

In my opinion, it presently is not necessary to translate the current material into computer processed data. However, Mr. Nyman will number all nodes and identify all responsibility patterns adequate to use computer processing if felt desirable in the future.

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November 13, 1974

Subject: Monitoring Report #3

Satellite and Geneva Remodeling (MP)

Burgess Norton Manufacturing Company
Geneva, Illinois

RJS Project: 74:43

Date of Monitoring: November 5, 1974 (working day 217)

Actions taken:

- Reviewed current progress on program with Mr. Nyman
- Reviewed site selection study briefly
- Set detailed site selection criteria
- Made rough preliminary cost projections for Satellite program

Geneva Remodeling

We did not do any major work on the Geneva remodeling program as there have been some dislocations to the original plan of work and the job presently is being managed on a day to day basis, within the plan prepared at our last meeting. This work is being watched carefully by Mr. Nyman and any interim replanning will be done by him.

Satellite

Our major efforts at this one day conference were to focus on Satellite site selection and building costs. In the morning we briefly reviewed the major site study and discussed the implications of this study. A portion of this discussion concerned the method of costing the building, and the work that had been done the day before with Powdered Metal was reviewed for possible application to the Satellite program.

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It was decided that the most critical element presently was to set a detailed method by which specific sites could be selected within the community and regional locations recommended by Fantus. In addition, it was felt highly desirable that a brief cost review be made of the present projected construction estimates to assure current validity. We also were going to, if time permitted, discuss the matter of writing an essential/functionally desirable/desirable program for the Satellite project and to review the method by which the project could be designed and built. Because of time limitations we were only able to set the site selection criteria and work on preliminary cost targets.

The Fantus report has isolated five communities in which a plant could be located. They further screen out two of these communities, leaving three which have been ranked by them in order of desirability. As we established our specific site detail criteria, the question came up regarding the distance from the recommended communities that Satellite would be permitted to go and still retain the desirability ranking of that particular locality. I recommend that additional discussions be held with Fantus to determine how far away from specific community #1 we could locate before it became better to go to community #2. This is quite important in our next step of the work since considerable time and travel will be involved in making specific site selections.

In approaching the method of rating specific sites, Mr. Nyman, Mr. Haselwood and I listed 21 major rating factors. We also gave each one of these a weight relative to the total selection process. A list of the major headings and the weights assigned are given below. Note that the weights have not yet been reduced to a percentage.

Weight	Factor being Evaluated
10	Specific site characteristics
15	Transportation characteristics (How does Burgess Norton transport people, material and equipment in and out?)
20	Labor (Includes plant trades, clerical and technical personnel)
20	Community attitudes and facilities
5	Tax characteristics

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Weight	Factor being Evaluated
2	Insurance influences
5	Financing (Here we are looking at the provision of ongoing cash to the business and to its employees)
5	Security
25	Energy sources (electricity and gas)
15	Utility availability (other than electricity and gas)
5	Site geography relative to surrounding area
17	Existing industry characteristics
4	Recreational facilities available
10	Characteristics of available housing for employees
15	Existing support businesses (those with which Burgess Norton would do business locally)
8	Climate
8	News media attitudes and quality
8	Construction characteristics of community
10	Government quality and attitudes
25	Local cost of doing business in that community on that site
15	Future projection of total area direction

Next, detail discussions were held of the factors to be evaluated under each major heading. These factors must be looked at in relationship to their desirability or their lack of desirability relative to any given specific site. The question to be answered in considering each item is:

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If we evaluate this site relative to another site, what value do we give to this weighted item factor to arrive at a fair comparison?

It was further suggested by Mr. Haselwood that as Mr. Nyman sets up his method of evaluating based on our discussions that a factor may be given a plus value if it contributes to the goals of the Satellite, a zero rating it it doesn't contribute and a minus rating if it detracts. Care must be taken not to give any factor a minus rating greater than its weight. Mr. Nyman will investigate the evaluation and rating technique in the next couple of weeks.

The detailed listing of factors under each major element is listed below.

Specific site characteristics - Weight 10

- Area
- Shape
- Topography
- Subsoil conditions
- Drainage
- Access to existing and new roads
- Access to existing and new utilities
- Access to rail
- Access to air transport
- Flooding potential
- Fire insurance classification
- Cost
- Zoning
- Easements
- Restrictions
- Ownership
- Forestation and vegetation
- Existing structures

Transportation characteristics - Weight 15

- Rail
- Highway
- Air
- Public
- Postal
- Private parcel delivery
- Foot
- Bicycle

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Labor - Weight 20

- Wages
- Skills available
- Jurisdictional characteristics
- Quantity of labor supply
- Quality of labor supply
- Fringe benefits
- Union characteristics
- Unemployment rate
- Mobility
- Commuting habits
- Quality of supervision available

Community attitudes and facilities - Weight 20

- Medical facilities
- Library facilities
- Elementary schools
- High schools
- Vocational schools
- Community colleges
- Four year colleges and universities
- Religious institutions
- Home ownership ratio
- Liquor regulations
- Civic and service organizations
- Parks
- Community meeting facilities
- Shopping facilities
- Business and professional societies
- Community aesthetic qualities
- Civic progressiveness
- Political climate
- Racial balance
- Banking facilities
- Social climate
- Attitude toward industry
- Community cost of living index

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Tax characteristics - **Weight 5**

- City tax rate
- County tax rate
- State tax rate
- Basis of assessments
- Unemployment tax rate
- Tax policies
- Personal property tax
- Tax incentives
- Expected tax future
- Income tax

Insurance influences - **Weight 2**

- Fire
- Workmen's compensation
- Public liability
- Medical
- Vehicular

Financing - **Weight 5**

- Industrial bonds
- Long-term bank rates
- Short-term bank rates
- Availability of loans
- Method of securing loans
- Community business attitudes toward money flow

Security - **Weight 5**

- Guard services
- Police protection
- Fire protection
- Crime incidence rates
- Surrounding neighborhood characteristics
- Fire district characteristics

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Energy sources - Weight 25

- Natural gas availability
- Natural gas cost
- Natural gas future source
- Natural gas quality
- Electric availability
- Electric cost
- Electric future source
- Electric service quality (particularly stand-by and emergency service)
- Propane availability
- Propane cost
- Propane future source
- Propane quality
- LPG (liquid petroleum gas) availability
- LPG cost
- LPG future source
- LPG quality

Utility availability (other than electricity and gas - Weight 15

- Water supply
- Water quality
- Storm sewer capacity and restrictions
- Sanitary sewer capacity and restrictions
- Process waste capacity and restrictions
- Telephone and other communications systems quality and availability
- Water rates
- Storm sewer rates
- Sanitary sewer rates
- Process sewer rates
- Communications rates

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Site geography relative to surrounding area - Weight 5

- Elevations of adjoining property
- Natural geographic barriers
- Distances to:
  - shopping
  - restaurants
  - offices
  - cities
  - housing
  - transportation
  - recreational areas

Existing industry characteristics - Weight 17

- Nature of operations
- Size of plant
- Number of employees
- Wages paid
- Benefits paid
- Union representation
- Transportation characteristics
- Acceptance of new industry by existing industry

Recreational facilities available - Weight 4

- Parks
- Golf clubs
- Swimming
- Fishing and boating
- Skiing
- Hunting
- Tennis
- Theater
- Spectator sports
- Baseball and soft ball
- Bowling
- Civic auditorium facilities
- Cultural facilities and events

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Characteristics of available housing for employees (considers the distance, quality, cost and availability of housing for employees) - Weight 10

- Single family
- Multi family

Existing support businesses (those with which Burgess Norton would do business locally) - Weight 15

- Product suppliers
- Production maintenance suppliers
- Service suppliers
- Tooling suppliers
- Building and plant maintenance suppliers
- Tool and die shops

Climate - Weight 8

- Temperature
- Precipitation (rain and snow)
- Humidity
- Wind velocity and direction
- Inversions
- Air quality

News media attitudes and quality - Weight 8
(This concerns the attitudes of the news media toward existing and new industry)

- Radio
- Newspapers
- Television
- Magazines
- Labor periodicals

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Construction characteristics of community - Weight 8

- Costs
- Quality
- Jurisdictional characteristics
- Union characteristics
- Quality of contractors
- Construction activity

Government quality and attitudes - Weight 10

- Snow removal
- Street maintenance
- Street cleaning
- Rubbish removal
- Competence of government employees and officials
- Political party majority
- Bonding capacity and rating
- Building codes
- Zoning ordinances
- Waste and water treatment
- Progressive outlook characteristics
- Current indebtedness relative to tax base
- Projected indebtedness relative to tax base

Local cost of doing business (in community) - Weight 25

- Local labor
- Local material and supplies
- Local equipment
- Local service fees
- Local utility costs
- Freight in
- Freight out

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Future projection of total area direction

- Weight 15

- Of immediate area around site
- Of community
- Of county
- Of state
- Of industry locally
- Of business locally
- Of energy supply at site and at source

This list will probably be increased and refined as the site search begins. I recommended to Mr. Nyman that he prepare criteria by which those relatively untrained in site evaluation could follow in making ratings of each of the factors. It would be good for each key executive involved to rate all of the sites being considered and then to compare on an item by item and total basis the findings of each individual. If this proves too difficult, then each individual should be assigned a group of sites to rate. However, in such a method it is possible that different rating systems would be used by different men. The need now is to set the value of the criteria and the relative importance that each of the sub-factors has to the overall factor. It may be very appropriate for me to again review the rating forms before they are printed in final shape and the actual process is initiated.

Our second major effort at this day's meeting was to prepare a very rough check estimate to establish what might be a minimal to moderate cost to be expected for the total facility. There are many elements that have not yet been totally defined. Therefore, our cost efforts were applied to establish a conservative bracketing of to-be-expected construction prices. This material was reviewed by Mr. Nyman and me in detail. He will evaluate the findings of that analysis and add in whatever items and work elements are appropriate for the specific nature of the Satellite program. We were not able to do any more than assume a well graded level site and our costs did not include the special pits, sumps, trenches, foundations, piping, power service and other elements that can only be determined once more detailed engineering studies have been made of the plan. The cost analysis, however, did indicate that we should be able to build this plant providing escalation does not take it out of the realm of possibility within the

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cost target established by the preliminary economic analysis that has been made.

Again, I urge that the operating statements be used to establish the target goals that can be afforded relative to building expenditures. Then, an essential/functional desirable/desirable listing should be prepared of all of the elements that go into the project that are contained in the project program. Next, a more accurate pricing of the minimal or essential items in the building can be made. If the essential building is lower in cost than the target that has been established, additions of items wanted over and above the essential building can be made based upon their nature and appeal. It is important to keep in mind the concept of designing and building to a target rather than designing, then estimating and finding out the target has been exceeded and having to go back and pare out items before construction can begin.

Although we did not have much opportunity to talk about how this project might best be built, it is becoming apparent that speed and close coordination of both the design and construction operations are going to be essential. It might be appropriate at this time to consider that the building might be built by a firm specialising in a total service package, such as a design and build firm. Thus, it would be possible to examine several alternatives, including conventional buildings, or pre-engineered metal buildings and make detailed evaluations of the essential building characteristics as the Satellite facility is engineered. This could be a matter for discussion at our next session if it is felt appropriate by the members of the Satellite team.

In the immediate future I suggest that the Satellite team concentrate on refining the project program, setting the essential/functionally desirable/desirable characteristics of the Satellite facility and refining the site search criteria into a working document that can be used by those who are going to make the detailed site search.

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RJS/m

To: Mr. Warren Rasmussen
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October 9, 1975

Subject: Monitoring Report #4

Satellite Program for Machine Products Division (MP)

Burgess Norton Manufacturing Company
Geneva, Illinois

Project: 75:38

Date of Monitoring: October 3, 1975 (working day 194 - working day calendar for 1975/1976)

Actions taken:

- Reviewed current status of program work with Mr. Nyman
- Evaluated current progress on project
- Reviewed building proposal plans in detail

General Summary

Early in the review Mr. Nyman, Mr. Rasmussen and I measured project progress against Mr. Nyman's level one network diagram dated April 29, 1975. Currently most work looks to be in very good shape. There are some areas lagging but these are not overly critical at this particular point in time.

One of the lagging items is preparation of structural steel shop drawings. Shop drawings were due to be prepared and approved no later than October 28, 1975 (working day 211). This process is just now getting underway although a contract has not yet been signed between Burgess Norton and the selected contractor. It is anticipated there should be no difficulty obtaining structural steel on the job by the current target dates.

Preparation of equipment specs, placement of orders, design of equipment and approval of designs also lag, although there is some overlap between the design and fabrication periods. Mr. Rasmussen and Mr. Nyman report that there may be some delivery compression possible now on certain items of equipment and therefore, it is entirely possible

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that the 250 working days allocated for fabrication of machinery as a maximum can be shortened as design and ordering proceed.

It is hoped to start delivery of equipment to the job in August 1976 and to pace arrival of equipment on through late November 1976 so the plant is able to begin integrated production by December 16, 1976 (working day 501). With the current status of work, it appears this is a feasible target to maintain.

Still to be held.

Our major work during the day consisted of reviewing building proposal plans and specifications, along with other project documents. To simplify this review, Mr. Nyman and I broke the work into several major elements. Points brought out during our discussion are covered at random below under each major subject heading.

Site Selection, Acquisition and Planning

- The site is now firmly selected and consists of a prime 19 acre site (A), a desired pair of sites (B and D)of about 10 and 3 acres respectively and a fourth site (C) of about 8 acres. Site A is under consideration for purchase. Site B is on an option to buy. Site D is not currently being negotiated; while site C is under a right of first refusal. I strongly suggest a firm decision on as much of this real estate be made at an early date so no hindrance to planning and construction is encountered. To start construction, it will be necessary to consummate negotiations for site A. These should be complete by October 17, 1975 (working day 204).

- Several supplementary documents are needed for proper design and construction of the project. These include:

  - a property line survey showing all easements and actual utilities

  - a topographic survey (Note: the topo presently being used is one made in April of 1974 apparently from aerial photos. It may be accurate enough to use for design and if so, an additional topo map may not be required.)

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- maps showing numerical information about all elements surrounding the site including utility invert elevations, both proposed and actual, top of rail elevations, road elevations and all other information of this type which may be essential to completing design.

New utility elements will be identified

generally ok

- There is considerable thought being given to various methods (purchase, lease and other) of holding and occupying this building. Some of these involve complex tax implications but it would be prudent if a decision as to the occupancy method would be made firmly at an early date.

- Mr. Nyman and I reviewed the building location and orientation at length. Apparently an orientation which places the office on the south elevation, the long axis of the building along the east/west line and the building at the approximate center of the site with room for expansion to the north and east is the scheme presently best accepted by Burgess Norton management. To be further considered, however, is the matter of rail service, both present and in the future, and a possible shortening of some utility lines and paving by relocating the office on the south elevation. The matter of the rail siding is very important and I strongly recommend, if time permits, additional analyses be made regarding locating the plant on the site so it can be served more easily by rail. This will become a critical factor if and when the plant is to be resold or otherwise disposed of. Ultimate value may depend in part upon ease of access to rail.

- Utility service has been guaranteed to be available from the Claremore Industrial Authority and others responsible for providing these utilities. It should be kept in mind, however, that with partial occupancy of the plant scheduled for August 16, 1976 (working day 415) that only 221 more working days remain before the partial occupancy date. Therefore, any long installation times on utilities could well pose problems to partial occupancy. Since there usually is a considerable amount of work involved in off-

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site services, they should be started immediately so no delay will be encountered. This is particularly the case since it is indicated that some of these utilities may run fairly deep and have to be placed in subsoil conditions not conducive to rapid construction.

- A part of the process piping system includes a pretreatment sewage plant to be constructed by Burgess Norton. This pretreatment plant is from the same design used at the Geneva, Illinois plant. I recommend it be checked locally for acceptance and appropriateness. The reason is that any required changes to the plant's design might add long lead time items. Since we have a relatively short construction period, delivery delays on this facility would be serious. It will probably be necessary to install a lift station since the pretreatment plant will be at an elevation dictated by the gravity flow from the plant.

  Location of the pretreatment plant is also important since it is a functional facility that will have to be aesthetically controlled.

- A question came up about fire protection lines and whether a loop would be required around the building for the system. If so, future expansion plans should be further evaluated to avoid disruption of fire protection service and expensive duplication of facilities in the future.

  To be further checked

  The fire protection system will undoubtedly have to be approved by local and insuring authorities. This sometimes is a time consuming process and should be followed aggressively.

  To be followed aggressively.

- It should be made certain that all utility facilities intended to carry or process waste or other effluent or supply to the future expanded plant are made of adequate capacity now to serve that purpose. This would include gas, domestic water, fire protection water, cooling water sewer, power, waste and cooling towers. In some cases such as with the cooling towers, it is expected to duplicate the present facility again for the expanded facility. This will provide protection against single unit unexpected shutdowns.

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- The parking areas appear to be adequate for present needs. There was minor discussion about shifting them slightly to better accommodate visitor and employee traffic.

- In expanding the plant, it should be considered that office expansion is usually most economically carried out at ground level. Therefore, sufficient ground space should be allocated in the site plan for office expansion as well as plant expansion.

  Presently there is some consideration being given to providing a concrete roof deck at the office that can be converted to a future second floor. Mr. Nyman and I reviewed this in detail and it should be analyzed relative to the cost differential and disruption potential as compared to horizontal expansion.

- No current information is available on the top of rail elevation for the main line railroad and the passing track. It will be essential to evaluate this elevation relative to the finish floor elevation to determine if adequate space is available to install a siding with the required grades. Our initial evaluation showed this should be no problem.

- An analysis of the soil borings indicates there is soft rock relatively near grade but that down about 8', a non-weathered sandstone appears. This non-weathered sandstone probably is fairly hard and will be more expensive to excavate than the weathered material above it. Therefore, it appears presently that strong efforts should be made to set floor elevations, trench elevations, waste and recirculating water lines and footing elevations so that they can be kept above the hard strata. However, there should be provided adequate room between the bottom of the floor slab and the top of the footing so that both now and future underground utilities will be able to be placed with relative ease and minimal disruption to footings and other structures.

Should be able to excavate w/ backhoe

Using int. caissons and ftgs only — ext ftgs. Should check el. of ext ftgs.

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- Mr. Nyman and I reviewed in some detail the projected future requirements of Burgess Norton at this plant. Present plans indicate that the maximum development will be about four times the plant size as projected or an increase from the current 80,000 sq. ft. to about 300,000 sq. ft. To properly achieve this kind of expansion, it will be necessary under present considerations to acquire parcels A, B and D.

  As part of our discussion, we also reviewed the need to set targets by which identifiable firm decisions are made. In the case of present and future site planning such a decision on property acquisition is critical. Thus, since future expansion direction is also important to current functional planning, decisions on site acquisition must be made promptly.

Functional Relations

- Mr. Nyman and I made a very brief review of the various functions in this new plant. They include:

  - office
  - labs
  - manufacturing
  - parking
  - storage
  - shipping
  - receiving
  - employee comfort
  - administrative and manufacturing services

  A very quick analysis showed that most relationships had been adequately taken into account. It might be desirable to make some minor revision to entrance locations that will improve traffic patterns and this will be analyzed.

  Again, as with the real estate and site planning, I suggest Mr. Nyman set firm target dates by which all functional building elements are shown in their proper and approved relationship to free up completion of working documents.

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Working Drawings and Specifications

- **Site**

  Site work is discussed at length above. In our meeting we also carefully reviewed interfaces between on-site and off-site facilities. Utility interfaces will include those between gas, water, sewer and power. Other physical interfaces are road and rail elevations and storm drainage connections.

  One of the most critical elements in proper preparation of a good site plan is to insure that there is a correct and accurate interrelationship between on-site and off-site elements.

- **Sewage Treatment Plant**

  This item has been discussed in detail above. It is again recommended that the criteria for the plant be reviewed in detail so that working drawings for its construction can proceed immediately.

- **Substructure**

  Our discussions indicated that footing installation should be such that the tops of spread footings are about 3' below the bottom of the structural floor slab on grade. This is to allow present and future utilities to be placed in the space between the slab and the footing. Also, keeping footings low will allow maximum flexibility of trench drain location. I suggested to Mr. Nyman that the trench drains be located and detailed as early as possible so if any elevation changes are necessary, they can be made before the job gets into the field.

  Footings should be designed so the slab on grade is not an integral part of the structural foundation work. It is desirable to allow the floor slab on grade to be constructed independently either prior or subsequent to

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erection of the structural frame and the exterior walls. This is particularly important in relation to exterior walls. Here it is suggested that walls rest directly on an exterior foundation wall rather than the slab on grade.

To be done as facility is made

- Superstructure

Apparently the present design utilises the Butler landmark building. Fabrication and delivery seem to be no problem although it would be desirable to release the structural steel for order as soon as possible.

Delivery is done

There has been some consideration of additional loads and of course, the crane loads that are to be supported in the crane bay. It would be good for Mr. Nyman and Fleming to confer once more to insure that all hanging loads have been identified and the proper technical considerations given to them. This is especially important to complete prior to start of fabrication of structural steel.

all identified

Also, all special framing such as at mezzanines and roof openings should be identified and fixed. Roof openings will be plentiful on the project, particularly at the heat treat and in the annealing and coating areas. Many roof openings have been located but there still remain quite a few that need to be further dimensioned. It is far better to know where these are prior to start of erection of the structural steel since it expedites erection and minimizes field fabrication.

Still need coolants effect

- Exterior skin

Considerable discussion ensued at this point regarding the nature of the lower part of the exterior skin. It has been generally agreed that the Satellite plant should have a rigid, hard, durable sill wall to door frame height, about 7 ft. Several types of sill walls have been considered, including protected metal siding, masonry and precast concrete. It is essential that the panel have good insulating

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qualities and a high resistance to abrasion and impact loads. I suggested to Mr. Nyman that he visit several plants nearby that have different types of sill walls and observe and gather comments regarding the performance of these various systems. The small amount of extra time spent in doing some investigation of this very important matter will pay large dividends during operation of the Satellite plant.

As noted above, it is desirable to make the exterior wall independent of the floor slab on grade. This is to maintain flexibility in terms of when the floor slab is poured relative to close-in of the building. Since the exterior skin of the building will be an early fabrication item, color selection of siding, doors, panels, paint and other such materials should be made now. Opening dimensions and locations for doors, windows, louvers, hatches and other such items should be set early. This, again, to minimize field fabrication which is costly and time consuming.

No why does yet will be kept light

There is strong interest by Burgess Norton in having convenient walking access to each roof top unit. Therefore, a catwalk is being considered that will be set on top of the roof. This catwalk can be anything from a very simple wood duckboard with handrail to an elaborate prefabricated metal runway. I suggest it be kept light and simple and easy to connect to the roof. The connection should be of a type that does not penetrate the roof deck.

How on allow Butler to select design

- Interior rough work

The specifications for interior rough work, primarily mechanical and electrical piping, sheet metal, conduit and fire protection appear to be in good condition. It was not possible, because of time and technical considerations, to make a full evaluation but the work to date seems to have been competently performed.

Mr. Nyman and I discussed at length the use of performance criteria in mechanical and electrical systems installation. It is important to remember that we want stated performance guaranteed, in the installation of rough, finish and systems mechanical and electrical work. This is a very important

Continued

element to understand particularly early in the design period prior to where full working drawings and specifications are available for evaluation.

- Interior finish work

The most important factor to keep in mind here is that color and sample selection must be expedited continually. One of the biggest delays to finishing off major construction projects of this type is late selection of materials, particularly when these materials are of a long lead time nature. I recommend a detailed list be prepared jointly with the contractor and the architect/engineer of all items that are necessary to review, approve and select color and texture for. At that point these should be given a high priority of attention by responsible executives at the Burgess Norton home office.

Contract Content

- Mr. Nyman and I discussed briefly whether the contract content defined the scope of work adequately. Our general conclusion is that - yes, it does - especially if the program Mr. Nyman prepared for the Satellite project is included as a part of the contract. It is important that all documents be properly referenced by date and be specifically identified.

Also it is important to clarify what documents are referred to on page four of the proposal in the section - obstructions and unforeseen conditions. Here reference is made to variances from plans approved by the owner. It is these plans approved by the owner that must be identified explicitly.

Dated on o.c.

I pointed out to Mr. Nyman that it is important for him to be prepared in negotiating the final contract with Fleming to clarify any unclear or overly general points in the owner's program. This is only fair to both parties since in some cases numbers have not been attached to the items included in that program.

- **General requirements**

  There was some thought that general requirement specification should be prepared now. However, it appears that with the owner's specification and with the details as set forth in the proposal there should be no additional need in the scope of work documents for a general requirement section.

  Will be prepared as part of wkg documents?

  The final specifications though should contain a general requirement section since this will define what is intended in the way of such items as job facilities, testing, temporary heat and other such elements.

  As a further thought, it will be important to gain a full knowledge of the contract arrangements of Fleming's subcontractors so it can be clearly established whether or not an expenditure by them for general requirements is a cost to the job or included as a part of their work. I suggest that the matter of subcontract arrangements be reviewed in detail with Fleming and an agreement on details obtained.

- **Plan of work and turnover definitions**

  Since there is to be a partial occupancy of this facility starting in August of 1976, it would be wise for the owner to insist on a well defined work sequence that shows clearly the successive points at which spaces will become available. I recommend that a network plan be prepared of the project construction and that it be monitored regularly to assure the project is moving in accordance with the diagram.

  Is defined on Fleming's network.

  Should report to Arnold N against their network.

  The first area needed will be the service, grinding and lapping areas where early equipment will be placed. It may or may not, depending upon the circumstances, be desirable to have sections of the office building also available at that time. A disadvantage of moving into the office early is the possibility of damage and dirt due to construction and equipment installation activities.

  Revised to receive some machines & linen first.

Another sequencing problem may be that equipment operation to service the office areas would entail early startup of mechanical and electrical equipment prior to the time when they were to be put into full use for the finish facility.

- **Payments**

The payment schedule is to be worked out between Mr. Nyman and Fleming. Mr. Nyman is well acquainted with various types of payment techniques and we discussed this only briefly.

It would be wise in considering how payments are to be processed to establish some control over the general contractor's payments to his subcontractors. This is oftentimes critical although it appears on this job that it should be no major problem. Nevertheless some conversation about this matter should be held so everyone clearly understands that if payments to the general contractor are to be made promptly that, in turn, his payments to subcontractors should also be made promptly. This is one of the quickest and easiest ways of insuring good job performance and morale.

- **Warranties**

My advice here is - be reasonable. If, as a convenience, some equipment is put into service early, consider the fact that this is a service and perhaps a courtesy that deserves reasonable attention.

- **Insurance**

This matter has been reviewed by the Burgess Norton organization and is well covered.

- **Who buys what?**

In the owner's specification there are several items that are specified as being the responsibility of the contractor, either to buy, install or both. It would

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be advisable where these items do not presently appear on the drawings to insure that a count is given and that they are located in the plant. Oftentimes a piece of equipment requires special plumbing or other attachments to be installed early in the job. It would be helpful to get this information in the designer's hands as quickly as possible.

Are presently clarifying this.

- Subcontractor review and selection

  I recommend Mr. Nyman quickly clarify with Fleming the process of selecting and approving subcontractors, both major and to present subcontractors. This is a very important item since Burgess Norton is working on a time and material basis with an upset price position. Therefore, selection of subcontractors is a joint responsibility.

  To be left in their hands.

- Agency reviews

  Many agencies must be considered in constructing a building. There are OSHA, EPA, erosion control agencies, fire rating and fire inspection agencies along with the numerous building and approval groups. It should be clearly stated and specified who is to get approvals and work with these agencies. Presently Mr. Nyman will do all this work. However, the job may prove sizable and it would be wise to consider this entire area as a joint responsibility between the owner and the contractor.

  Still will be done by Arnold Nyman.

  It should be clarified who gets building permits. Presently it appears the owner is obligated to purchase these although there is some confusion as to whether the contractor submits for them or not.

  Have not got these yet.

Procedures

- Approvals

  Major approvals will be needed on shop drawings, samples, colors and materials. It was decided at this session that

  Have set them up.

Mr. Nyman would confer with the contractor and the architect/engineer to set up a sequence for technical approvals. This should be based upon the mutual trust and confidence in the professional and technical abilities of each party. On more subjective approvals of materials, samples and other elements that must be reviewed by other than technical parties, I suggest a representative of the executive staff in Geneva be given the responsibility of such approvals. This matter will be worked out by the staff in Geneva.

- Changes to the work

It is important to remember that there are two basic elements to any project revision. The first is to identify and define the change and the second is to provide an estimate of the change and approve it as an official revision to the contract documents.

Identifying the change to be made is usually done in a bulletin which originates from the changing party and requests that the change be priced. An estimate of the cost of this change is then prepared and submitted. An evaluation is made of the change and its cost, and if approved, a change order is provided as an official change in the contract.

Usually bulletins originate with the owner, the architect/engineer or the contractor. The bulletin is usually estimated by the contractors and the change order is usually prepared and approved by the architect and owner. Occasionally emergency changes must be made in the field and have to be authorized prior to the time that would normally be taken for preparing a bulletin and a change order. These are covered by field orders. It might be well to consider that the field order is work to be done immediately and is officially a part of the contract but must be confirmed at a later date by a change order. Mr. Nyman will discuss this process with those involved and see what procedures they prefer to use on this project.

- **Daily reports**

  It should be expected that the contractor's full time superintendent on the project will prepare a daily superintendent's report and submit this to the project manager for Fleming. This report does not necessarily have to be submitted to the owner although it should be available for inspection as required.

- **Monitoring**

  As noted above, I recommend a regular monitoring of the progress of the job be done by an objective third party on a periodic basis, perhaps once per month.

- **Testing**

  Mr. Nyman is currently entertaining a proposal for soils and concrete testing from a local testing organization. This is essential and the major consideration here is which organization is to do it and upon what basis. It should be done on the basis that the testing firm will report directly to the owner but perform services for those contractors on the job who require such services.

- **Waivers of lien**

  This matter requires some clarification from the contractor relative to the intent of his lien provision in the proposal. Mr. Nyman will go over this with him.

- **Punching out, cleaning up and moving in**

  Punching out procedures are those activities that insure the area is totally acceptable to the owner and that any damage or incomplete work is repaired and put in good condition. It was decided at this session that Mr. Nyman, in conjunction with the architect/engineer and contractor, would punch out the project personally. This is a good move and should be defined early to the contractors.

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- Auditing of actual costs

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It would be wise to audit the actual costs on this project periodically, perhaps every two months. This matter should be discussed with the auditing department of Burgess Norton and agreement reached with the contractor as to the frequency and the method by which this is to be accomplished.

Audit problem has been established

Ralph J. Stephenson, P.E.

RJS
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To: Mr. Arnold Nyman
Mr. Warren Rasmussen

RALPH J. STEPHENSON, P. E.
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December 17, 1975

Subject: Monitoring Report #5

Satellite Program for Machine Products Division (MP)

Burgess Norton Manufacturing Company
Geneva, Illinois

Project: 75;38

Date of Monitoring: December 15, 1975 (working day 244)

Target Date of first equipment arrival - August 2, 1976 (working day 405)

Target Date for office occupancy - September 7, 1976 (working day 430)

Target Date for activation of entire new facility - December 16, 1976 (working day 501)

Actions taken:

- Reviewed current status of program with Mr. Nyman
- Evaluated current equipment procural and construction progress
- Continued review of outstanding items relative to project construction

General Summary

At this monitoring Mr. Nyman and I reviewed the current status of the points covered in Monitoring Report #4 in detail. We also added additional discussion elements as appropriate. These are reviewed later in this monitoring.

Currently, construction work in the field is just getting underway with major earth moving presently in progress. Ground was broken on Monday, November 24, 1975 (working day 230) and it had been intended to proceed immediately into foundation work. However, heavy winter weather has caused this work to be delayed.

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Working drawings for building foundations are presently en route to Mr. Nyman and at present do not appear to be a delay element. However, it will be important to insure that site preparation and foundation construction proceed as rapidly as possible since erection of the steel superstructure depends upon completion of foundation work. This is a critical item in the work plans.

Monitoring work progress against the level one network diagram prepared by Mr. Nyman and dated April 29, 1975, completion of working drawings lags slightly although some dovetailing of ordering long lead time building items has been in work. Continuous attention must be given these long lead time items. This will be especially true of electrical equipment, roof top units and waste treatment plant components. Another element that shows as lagging the network is design of dies and related equipment. There has been very little work done on this activity since the previous monitoring on October 3, 1975 (working day 194), and if durations shown for the activity sequence are accurate, there will now be difficulty meeting targets for machine tryout. This item should be watched carefully.

Points covered by Mr. Nyman and myself in detail during our conference are reviewed below at random.

- It is highly recommended that work begin now on a Claremore 1 project file (COP file). This should be a compilation of all of the major documentation assembled during the entire course of the Satellite program. The reason for an early start on its assembly is to avoid the need, when the project is complete, to take time to put such a master file together. The reason for assembling a COP file is so that as the plant is moved into completion, activated and operated, that a full design and construction history is available. This information normally proves invaluable since it is a constant source of data and is the thread of continuity that runs through the ongoing managerial process.

  The COP file is defined as a collection of documents, reports, drawings, studies, specs, estimates, contracts, networks and sketches defining the project from its inception in March 1974 to start of operations presently projected in December 1976. The file should be kept confidential, accessible in its entirety only to top management. However, it should be in such form that any portion can be abstracted for use by all levels of management.

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It is recommended that no documents once placed in the file be allowed to be removed without permission of Mr. Nyman. Preferably, copies are to be made where required. Contents of the master file might include such things as:

- property line surveys
- topo surveys
- aerial photos
- site photos
- utility locations and elevations
- rail elevations and proposed siding descriptions
- lease agreements
- gas supply agreements
- easement agreements
- EPA releases
- pre-treatment plan working drawings
- building working drawings and specifications
- building permits
- soil borings
- field reports
- sign-off documents
- subcontracts and proposals
- etc.

This list should be extended as the project proceeds.

Again, it is desirable to begin preparation of this master collection now rather than waiting to near the end of the project when the interest and enthusiasm in assembling it will be considerably diminished by the drive to move in, activate and operate the new facility.

- Most maps and surveys required have been made. A new topo was prepared and new utility map will be prepared as information is obtained regarding utilities being brought to and past the site. When all off-site elements are completed, it would be wise to insure that an up-to-date, as-built off-site utility plan is prepared.

- Rail siding characteristics have not yet been determined although Mr. Nyman has submitted a building plan to the Frisco Railroad with the request that they review the building location, orientation and expansion for siding appropriateness. It would be wise to follow this carefully so as to have the necessary rail information in the file even though a rail siding is not a part of the initial project.

- The E. L. Anderson Blvd. presently ends just south of the plant property line. A turn-around is to be constructed at this point and some concern is currently felt about the design of this turn-around. Mr. Nyman is working on design revisions. They should be determined in the near future since some utility work adjoining the area will be affected by the turn-around construction.

- Utility service to the building site is presently defined in a set of documents which have been prepared by the city and will be let to local contractors. I strongly recommend all water line and sewer characteristics and sizes be technically reviewed to confirm their appropriateness for the project.

  It is important that these off-site utilities be of adequate size to handle not only present requirements but also future needs. It also would be wise to insure that the materials specified are appropriate and will be adequate for the service intended.

- On the off-site utility drawings, road construction for the E. L. Anderson Blvd. is shown which depends upon the right-of-way being rough graded previous to the start of contract work. It is essential to clarify who is to take care of the rough grading and under what contract conditions.

- Electrical service and charges to the Satellite facility are still unresolved. There is considerable discussion currently underway about rates and the provision of primary transformation equipment. Since transformation equipment normally is a long delivery item, it is a matter that should be settled immediately.

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Plant equipment is due to arrive at the job site on August 2, 1976 (working day 405), 161 working days from today. Since permanent power should be available when equipment arrives, it becomes critical to clear away all pending electrical service problems.

- Gas is to be provided by Oklahoma Natural Gas Company to the northwest corner of the site by August 2, 1975 (working day 405). This matter should be continually expedited to insure gas service will actually be available on that date. It probably will be necessary to interface the on-site gas lines through a meter with the service to the site. Therefore, this is an important point of connection to off-site elements.

- The sprinkler system is presently designed schematically. The approvals needed normally for a contractor to start installing the fire protection system are normally obtained from local and state agencies. It would be good to get these design approvals at an early date and to insure that all on and off-site water supplies are in conformance with code and insurance requirements.

- The sewage treatment plant presently being designed will have a capacity of double that needed for the first phase of the Satellite program. Working drawings are expected to be available in two weeks, after which approvals on the design will have to be obtained from the various agencies involved. EPA review should be given close attention at the outset. It is important that this pre-treatment plant be cleared so that the equipment can be placed on order. Often several months are required to secure such equipment and the plant is an essential part of the total Satellite operation.

- An allowance has been provided for the permanent project sign on the site. It might be that this sign could be erected at an early date, perhaps in late spring or early summer, for its advertising value. There is currently a good construction sign at the site which, for now, provides adequate project identification.

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- It was decided sometime ago to provide a concrete roof deck at the office building to allow expansion to a second floor. Care should be taken in detailing column connections at the second floor level that new columns can be erected and the entire structure at the second floor closed in without disturbing the roof - this, to maintain water-tightness below. I suggest the details at the future connections be reviewed carefully to insure they provide water-tight expansion capability.

- There is a non-weathered sandstone about 8' below present grade. Test holes have been dug using a back hoe and presently it appears that excavation at the trench pit and other deeper areas can be accomplished without explosives.

  Interior column supports are to be drilled caissons which will probably be carried to the sandstone thus allowing smaller diameter caissons and providing greater flexibility than allowed with column footings for utility placement.

  Exterior column footings will be spread footings dropped about 2' below the bottom of the slab on grade. I recommend that an evaluation of footings on the expansion sides of the building be made to insure adequate utility flexibility is available where utilities must cross into the new addition.

- Mr. Nyman and I discussed the approvals and sign-off procedures in detail. There was some concern as to how this might be done most appropriately and by whom. I do feel that the final documents should be scrutinized and where possible, approved by all parties responsible for their conception and preparation. However, there is some difficulty doing this and the matter will be studied in more detail by Mr. Nyman over the coming weeks.

- Trenches to serve various pieces of equipment are not yet completely located on the final drawings. These will be spotted as the new equipment plan is prepared. This equipment plan is presently in preparation and should be finished by the end of January 1976.

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- Roof openings are generally located but not explicitly dimensioned as yet. It would be good to discuss the desirability of further defining roof opening locations with the contractor to see if cost savings could be made by early, accurate dimensioning.

- Presently it is desired to have catwalks interconnecting all roof top units for ease in maintenance and filter replacement. However, the question arises, if a catwalk is provided, do further safety features have to be included which might make the cost prohibitive and the appearance less than desirable? Since it will be necessary to service the units, this problem should be given ongoing consideration during the design period.

- Plant lighting is still in the discussion stage and it was recommended during our conference that a cutoff point be established for setting the type of lighting to be used. Mr. Nyman will work on this cutoff point.

- A network plan for construction of the plant has been prepared by Fleming showing the interim occupancy points. This network plan appears to be reasonable although containing less detail than desirable. I recommended to Mr. Nyman that he review the plan with Fleming, make needed revisions and then make certain the project is monitored regularly from that plan. I further suggest that as the work progresses, a more detailed diagram of the work be obtained from Fleming.

- The design elements such as independence of floor slab on grade, construction of sill walls, determination of hanging loads and location of special framing have been given careful consideration and these matters are all substantially resolved.

- There should be ongoing clarification of who is to do the installation of what equipment. This is always a difficult area and will have to receive ongoing attention throughout the entire project construction period.

- I suggested that Mr. Nyman obtain copies of all proposed and let subcontracts. It is an obligation of the owner to insure that he does actively review subcontracts since by the nature of the contract, it is a joint responsibility with the general contractor.

- There has been a change in the first area to be occupied. Originally it was felt this would be grinding and lapping. However, presently automatic screw machines are to be brought in first and will be the first equipment set on August 2, 1976 (working day 405).

- I suggested to Mr. Nyman he prepare a detailed check list of all agency reviews and approvals required for all elements of this project. Construction today has become so exceedingly complex due to influences of outside institutions that such a check list is essential in any major developmental program.

- Apparently a building permit has not yet been obtained. I suggest this be done quickly, either a foundation permit or a full permit.

- As a part of final approvals, the CIA will have to review and sign off on the working drawings. This - to insure adherence to CIA standards.

- Mr. Nyman and I discussed in detail the matter of internal approvals on subjective elements of the project within the Burgess Norton organization. This is an important matter since many project characteristics will be of concern to several levels of Burgess Norton's management. Therefore, it is important to establish a procedure for obtaining such approvals and to set deadlines as to when approvals must be obtained so as not to hold up field progress.

  Mr. Nyman will identify and set such cutoff dates over the coming few weeks, as working drawings and specifications are prepared. These cutoff dates are best established by the use of the network plan in conjunction with schedules for finishes and equipment shown on the drawings.

- A procedure has been set with Fleming regarding changes to the work. This procedure should be reduced to writing so all parties are clear on this matter.

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- Approval procedures on shop drawing samples, colors and materials external to the Burgess Norton organization have been established with the contractor and his architect. This should be reduced to writing.

- A cost auditing procedure has been established by Burgess Norton and agreed to by Fleming.

- Operator training programs are now being prepared in conjunction with the Oklahoma State Department of Vocational and Technical Education. This training is to prepare at least 58 people, plus several additional, for potential employment with Burgess Norton at the Satellite plant.

  The training program will require approximately 108 hours, three hours per night for three nights a week. It is expected the material for this class will be classified by major manufacturing areas with perhaps as many as 30 or more presently identified. Each of these major training areas will be outlined and training aids developed for the class material.

  A rough preliminary diagram shows that if continuous and intensive attention is given this training program that probably by mid-April it could be completed and ready to be put into work by July. The present target is to start the class beginning July 1, 1976 (working day 384) and to bring four classes through in approximate one month lagging segments. This will complete an adequate training program to staff the early plant operation in October 1976.

  There are some inherent problems in such a program and Mr. Nyman and I discussed these. Essentially they consist of how to establish a sense of worth about the course if no tuition is charged; how to select those who successfully complete the course for employment without offending those who are not selected; and thirdly, what to do with those who perform well in the course but are not able to be placed with the company.

  Overall, the program appears to have much merit and if it is to be used, should be given continuous attention by the permanent staff of the Satellite facility. There have been tentative dates

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set by which to establish permanent organizational structure at the plant and if it is intended to carry out this training program, it would be wise to firm the organizational plan at the plant so they who are responsible for the plant operation, will also be involved in the training effort.

- There was some discussion at our meeting about the impact of the potential common situs picketing bill now pending before the President. If this is signed into law, it could have an impact upon labor relations in the area. Although these labor relations presently extend only to the construction program, they may also have some impact upon ongoing operation of the plant.

Ralph J. Stephenson, P.E.

RJS
m

To: Mr. Arnold Nyman
Mr. Warren Rasmussen

RALPH J. STEPHENSON, P.E.
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February 13, 1976

Subject: Monitoring Report #6

Satellite Program for Machine Products Division (MP)
Claremore, Oklahoma

Burgess Norton Manufacturing Company
Geneva, Illinois

Project: 75:38

Dates of Monitoring: February 5 and 6, 1976 (working days 280 and 281)

Target dated first equipment arrival - August 16, 1976 (working day 415)

Target date for office occupancy - September 7, 1976 (working day 430)

Target date for activation of entire new facility - December 16, 1976 (working day 501)

Note: The above dates are subject to revision as the work proceeds. However, currently the dates shown are substantially those being held as field targets. The contractor is planning to complete the office area by August 2, 1976 (working day 405)

Actions taken:

- Inspected project and site
- Reviewed job progress with Fleming Company project manager and job superintendent
- Participated in meeting with Mr. William LeGate, executive director of the Claremore Chamber of Commerce
- Reviewed off-site utility problems with appropriate parties
- Prepared network diagram for off-site road and utility work at Anderson Boulevard
- Reviewed educational and training program in detail
- Prepared preliminary network for preparation of pre-employment training basic orientation class packet (PET)
- Evaluated overall job progress

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General Summary

This trip consisted of a visit to the job site to evaluate construction progress, an extensive conference with the Fleming Company staff, who are designing and constructing the facility and a further review of the equipment and training program progress with Burgess Norton staff.

In summary, field progress on the project has been fairly good with about 60% of the footings complete and structural steel arriving in quantity on the job site. It is anticipated that structural steel will start by its current target of February 20, 1976 (working day 291). The building site has not yet been completely filled since there are certain local areas that must be backfilled and compacted after foundation walls are in place. An item of importance is information regarding underground utilities, trenches and equipment characteristics that will affect underground work. Extensive discussion was held with the Fleming staff at our meeting and it is expected that a detailed checklist will be prepared as a result of this discussion.

I suggest that installation of building work at and around each machine be broken into work below the slab, work in the slab, work at the machine and work above the machine. These descriptions will take care of most services required, and particularly in this early stage, will focus attention on that work that is necessary below and in the slab on grade. The slab on grade still remains one of our most critical areas since it is presently anticipated that equipment will begin arriving on the job August 16, 1976 (working day 415). This is only 135 working days from our field inspection date.

As part of our work in Tulsa and Claremore, I stressed to both Burgess Norton and Fleming the need to reduce change requests and official approvals on changes to writing. To review, it is wise to always follow up any request for cost estimates on proposed changes with a written request that outlines in detail the change anticipated. Once this change has been approved, it should be made an official part of the contract document by the issuance of a change order. Requiring that all requests for proposals be reduced to writing will serve to maintain good control on the job and tend to reduce the number of changes requested and required.

I reviewed recommendations for this process in depth with Mr. Sellers and Mr. Nyman and it was agreed that a formal procedure would be instituted and carried out. Due to the short time available on this job and because of the high accountability level the project enjoys, I recommend again that this matter be given a high priority of attention.

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While in Claremore, we stopped at the Chamber of Commerce office and discussed the construction of off-site utility and road work, particularly at the Anderson Boulevard area. It appears that the city of Claremore is currently anticipating federal assistance in the project which may require extensive affirmative action documentation. Since approval of this type of documentation is somewhat difficult to predict, we made every effort to determine how long it would take before advertising for proposals could start and work be initiated in the field. The information available was not adequate to indicate much other than this might be a very critical part of the project and it is expected that Mr. Nyman should revisit Claremore shortly to again go over the critical elements of this part of the work.

The road to the site is especially important since equipment arriving early on the job will be very heavy and will need a good road bed to gain unhindered access to the site. In addition, it is essential that the underground utility work be substantially completed by the time early occupancy of the facility is begun. This is contemplated, as noted above, about the early part of August, 1976.

Also of importance are the other off-site utilities which are needed including gas service and fire protection. There was no information available at the time of our monitoring on these two elements and Mr. Nyman will investigate the current status of these along with his review of the other off-site utilities.

Another element that could prove difficult and should be considered in the same high priority category as the above three is the small waste treatment facility that processes effluent from the plant. Normally equipment for such a plant, along with some of the cast iron pipe, sleeves and other material, is almost always difficult to acquire. Not only that, but adequate environmental protection act approvals should be obtained so that approvals are not a delay to the start of construction.

Upon return to the Geneva plant, Mr. Nyman and I monitored the master summary network in detail. Most elements on this network are quite close to being on target. Still to be watched are the design of dies and related equipment although Mr. Nyman feels that this activity will soon pick up tempo and be brought back on schedule. Also, to be watched continually are approval and acquisition of long lead time building and equipment items. It cannot be stressed too much that the usual problem on projects of this nature is not in the actual performance of the activities but in the prompt delivery of needed material and equipment.

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In summary, at this time, it appears the project is reasonably healthy but that special attention must be given to long lead time building items, resolution of equipment characteristics, particularly those that affect the sub-base and the slab on grade and greater predictability in the construction of Anderson Boulevard, related utilities, gas service to the site and the fire protection loop. Also to be watched carefully is the preparation of material for the training program necessary to have competent staff to put the plant on line.

Below are reviewed the points beginning on page two of Monitoring Report #5, updated as of this latest monitoring.

- I again highly recommend that the Claremore project file (COP file) be prepared. A full description of this is given in Monitoring Report #5 and my reason for urging that it be done early is so it is not deferred to a point where it becomes an unreasonably difficult task to perform. This file will be especially important to the operating managers of the plant and should be started now so that it is an accurate reflection of what goes into the plant construction.

- A new utility map will still be needed as information is obtained regarding utilities brought to and across the site. Utility locations are always important to a project and adequate knowledge of their location and size is critical to proper plant operation.

- Rail siding characteristics have been generally established and Mr. Nyman is currently satisfied the information is suitable to do any rail siding planning that might be required.

- Design of the turn-around at the end of E. L. Anderson Boulevard has been resolved.

- Utility service to the building site has been discussed in detail above. I further recommend, however, that a technical check on the size of utilities, particularly the sewer line, be made to insure that it is adequate for future demands on this particular stretch of line. This is important since if the line is suitable only to handle the Burgess Norton facility, it might be that restrictions might be placed later on Burgess Norton use of the off-site sewer if additional plants are connected into it.

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- Rough grading for the Anderson Boulevard construction has generally been completed by Fleming.

- The electrical service and charge matter to the Satellite facility have been resolved except the matter of transformation equipment. Mr. Nyman is currently working on this. Again, it should be pointed out that plant equipment is due to arrive in August and that permanent power should be available when equipment arrives so that no delay to installation will be encountered.

- The matter of gas service by Oklahoma Natural Gas Company has been discussed above. I repeat that this matter is important to resolve and get underway as soon as possible since very little time remains between now and when gas will be required at the job.

- Sprinkler system approvals are presently being obtained for installation to proceed. Mr. Sellers mentioned that the fire protection contractor they normally use is excellent and has a good track record in the area.

- The waste treatment plant is still a matter of concern and I recommend it be given a high order of priority attention. Of particular concern is to insure that flow metering equipment, wall sleeves and inserts, cast iron materials, aluminum gratings, valves, field mounted devices and the scraping devices and machinery be expedited as much as possible. These always prove to be difficult items to obtain and since this installation is relatively small, these may not be available as quickly as desired. Also, as mentioned above, it would be wise to obtain all EPA approvals that are required so that no delay whatsoever will be encountered once this project starts. If the waste treatment facility is to be an integral part of the early plant operation, construction must begin at an early date.

- The project sign presently at the site is considered adequate.

- The concrete deck at the future second floor of the office is to be roofed so that the structural steel for the second floor can be placed on flush base plates without extensive disruption of roofing. Mr. Sellers feels that this can be accomplished without any leakage or water problems in the operating office below.

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- Interior column footings are generally complete and no major problems have been encountered. The weathered sandstone, however, may prove to be a problem with the installation of the sewer line at the Anderson Boulevard. Therefore, this is another reason for early action on installation of utilities at this area.

- Further discussions were held about approvals and sign-off procedures. I still recommend that final documents be reviewed in depth and approved in writing by all parties responsible for their conception and preparation.

- Trenches to serve equipment are currently being located as equipment characteristics are established.

- Roof openings are still not explicitly located, however, attention will be given this matter over the coming weeks.

- The cat walk interconnections are presently being reviewed.

- The plant lighting matter has been resolved.

- The network plan for construction of the plant prepared by Fleming has been revised and is apparently appropriate for present monitoring. We shall measure job progress against the Fleming network in subsequent monitorings.

- Most design elements relating to the structure have been resolved or are currently being worked upon.

- Equipment installation responsibility is being identified. ol

- There have been only a few subcontracts let and I again recommend that Mr. Nyman obtain and review copies of these subcontracts to insure that the joint responsibility implied with the general contractor is fulfilled in reviewing these subcontracts.

- Automatic screw machines are still to be brought in first. However, it is anticipated now they will arrive about mid-August 1976 instead of the first part of the month.

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- The detailed check list of agency reviews and approvals required for the project is in work. I strongly recommend that this be completed as soon as possible to insure that no loose ends are missed and delays encountered by unexpected required approvals.

- A project building permit has not yet been obtained. I suggest this be done as soon as possible. Mr. Sellers says that when working drawings are further along this will be obtained.

- We discussed the sign-off of CIA on the project and I recommend that they do be asked to review and approve the working documents. This will be considered.

- Internal approvals on subjective elements of the project including such things as color and furniture selection should be well defined early to avoid misunderstandings. This area of most projects is a difficult one and sometimes without adequate documentation and approval, procedures become disruptive and costly. The procedure should be set up now so that all concerned understand what is expected of them.

- Mr. Nyman and Mr. Sellers began to establish cutoff dates on various areas of the building design. This will proceed over the coming weeks.

- Procedure should be established with Fleming regarding changes to the work.

- Approval procedures apparently are set well enough so that all are satisfied currently with these.

- Cost auditing act has been established.

- The operator training program was reviewed in depth and I strongly recommend that preparation of the teaching material be initiated immediately. We prepared a brief diagram of one sector of the training program dealing with the pre-employment orientation class. There is considerable work involved in preparing the teaching material, particularly the sound and slide sequence and

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the video tape presentation. This matter was discussed at length at the Geneva plant and immediate steps will be taken to initiate preparation of the educational program in conjunction with the Oklahoma State Department of Vocational and Technical Education.

It is still the intent to begin training in early July and to bring four classes through in approximately one month segments. It is a difficult and time consuming job to establish an excellent training program as has been proposed here. Therefore, work should start now without delay if the target dates are to be met for initiating classes.

- The common situs picketing bill is not a problem at present.

It is anticipated that the next monitoring will be the first week in April. It will again consist of an on-site monitoring inspection of the project, a conference with the Fleming staff and meetings with the Burgess Norton staff in Geneva. I shall be in touch with Mr. Nyman to set the dates firmly in the very near future.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. Arnold Nyman
Mr. Warren Rasmussen

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

Subject: **Monitoring Report #7**

Satellite Program for Machine Products Division (MP)
Claremore, Oklahoma

Burgess Norton Manufacturing Company
Geneva, Illinois

Project: **75:38**

Dates of Monitoring: April 8 and 9, 1976 (working days 325 and 326)

Target date of first equipment arrival - August 16, 1976 (working day 415)

Target date for office occupancy - revised to August 2, 1976 (working day 405)

Target date for activation of entire new facility - December 16, 1976 (working day 501)

Actions taken:

- **Inspected project and site**
- **Reviewed job progress with Fleming Company project manager and job superintendent**
- **Made detailed review of slab on grade schedule**
- **Prepared preliminary management by exception system for assembly of tooling and equipment**
- **Reviewed pre-employment training orientation preparation progress**
- **Discussed organizational structuring at Satellite facility**
- **Evaluated overall job progress**

General Summary

This two days of review consisted of an inspection of the job site in Claremore, Oklahoma and in Geneva, Illinois, a complete review of all activities relative to the Satellite project.

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In summary, field progress has been good and most major work is either on or ahead of schedule. Structural steel is erected, insulation and roof deck are just starting and installation of pits, trenches and equipment foundations is well along. Field casting of wall panels has started but is presently delayed by lifting hook deliveries.

Waste treatment plant construction has not yet started and this is a source of concern since it was due to begin no later than March 25, 1976 (working day 315). There also are some long lead time deliveries which may cause some difficulty in completion. One of these is the emergency generator which is proving difficult to obtain. Some built-in items for floor slabs also may prove to be a problem.

Office structural steel is almost complete but lags presently by 4 to 6 working days. However, it is felt by the Fleming staff that this time will be picked up without any major difficulty. The next step at the office is to construct the roof deck slab. Mr. Sellers reports this work will begin Monday, April 12, 1976 (working day 327). It was due to begin no later than April 2, 1976 (working day 321). The office will quickly become critical since a move-in to the facility by Satellite management is anticipated on August 2, 1976 (working day 405).

Of special concern is construction of floor slabs on grade in the plant. Upon our return to the Fleming office, we reviewed the items necessary to get this work underway. Mr. Nyman reported that most major equipment has been selected and ordered and that information about equipment needs is being assembled and conveyed to the design and construction team. For convenience, the plant area has been broken into several zones. As part of our monitoring, Mr. Rasmussen, Mr. Nyman, Mr. Sellers and I reviewed the current status of at and below slab work in each zone. We also defined the number of working days from April 8, 1976 (working day 325) to the date that we could expect filling and fine grading to start for construction of the slab on grade in that particular zone. Mr. Sellers prepared an overlay identifying the zones and giving the working day amounts. These are tabulated below for reference. The number of days refers to the amount of time from April 8, 1976 (working day 325) until active, uninterrupted work on the slab on grade is anticipated to begin.

Zone #1 - Receiving

Slab on grade work could proceed now.

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Zone #2 - Machine Shop

11 working days

Need saw and washer layout, and anchor bolt details for stock reel.

not using a stock reel.

Zone #7

13 working days

Need flumes and layout details. Flumes are expected on the job April 20, 1976 (working day 333). These are critical and should be expedited heavily.

Zone #5 - Grinding

13 working days

The same flume situation exists here as in Zone #7. Also, Mr. Nyman must set a location for two capped floor drains and the trenches.

Zone #6 - Shipping

5 working days

Need scale pit location and details. Mr. Nyman will furnish.

need location

Zone #9 - Service

15 working days

Need location of waste and water supply lines, along with layout for maintenance and tool grind area.

Zone #10 - Locker and Lab

15 working days

Need lab layout. Mr. Nyman will work on this immediately.

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Zone #4 - Extrusion

10 working days

Must complete pit work. Also require scale pit details and location of two capped floor drains.

Zone #3D - Heat Treat

Ready to go.

Zone #3C - Heat Treat

25 working days

Several items are needed here, including loads on the coating tank superstructure to be built around the equipment. These are needed for footing designs. Also, required are trench and utility locations for equipment.

Zone #3A - Heat Treat

25 working days

Information needed on both present and future water lines from equipment. Also, monorail column locations are required for construction of foundations. Water reservoir construction is in progress and must be completed before slab on grade work can begin.

Zone #3B - Heat Treat

17 working days

Require final layout of equipment to set waste line locations. Also, must locate capped floor drains.

Considerable discussion took place regarding Anderson Blvd. The contract for this work is to be let Friday, April 9, 1976 (working day 326) and the contractor expects to move on the site within 15 working days or by April 30, 1976 (working day 341). The contract calls for construction work to be complete 66 working days from the award of contract or by July 14, 1976 (working day 392). It presently appears that this schedule is a very tight

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6/3/76 (TCN)

plan of work but if the contractor performs well, it is achievable. Some inquiry was made about the EEO and AAF programs of the contractor and apparently these are presently in order. However, again, this matter of approval is difficult to make predictable and should be followed carefully by the city of Claremore to insure there are no delays or holdups to installation of Anderson Blvd.

As supplementary discussion matter, we reviewed services to the site that might possibly go under Anderson Blvd. These include power and gas. If there is any underground work to go in prior to paving, it should be expedited now so Burgess Norton and others offer no potential delays whatsoever to the contractor on Anderson Blvd. construction. Mr. Nyman will get together with operating executives of the gas company to review installation procedures, right-of-way acquisition and to set starting and completion dates for installation of the gas service to the site.

Also, a continuous check must be made on provision of permanent power. Apparently full permanent power will not be available to the building until January of 1977. However, interim permanent power will be available as soon as service to the building is provided, and switchgear and transformation equipment is in place and activated. Switchgear presently is expected on the job 40 working days from April 8, 1976 (working day 325) or on June 4, 1976 (working day 365). Transformation equipment is due on the job 12 weeks from April 8, 1976 (working day 325) or on July 2, 1976 (working day 385). All matters dealing with power service and distribution to within the site or within the building should be resolved now.

Sprinkler drawings apparently have been approved and the line into the building is in place. However, there is some question about when the external loop will be in place. Although it appears that sprinkler approvals are well in hand, recent problems on other projects indicate a constant check should be made to insure that there are no loose ends that may delay installation. Rules and restrictions on design and installation of fire protection elements have become increasingly severe over the past two years and the characteristics of fire protection systems are such that they are integral to plant operations. Again, every possible delay item relative to fire protection should be cleared as soon as possible.

The waste treatment plant construction has not yet started since there had been some confusion as to the who and how of full governmental approval. The state has provided the city of Claremore with a letter saying that approval of the plant is within the city's jurisdiction. They further added that they

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6/3/76 (JCV)
? Mayor has kind of approval

found the plant acceptable. However, it will be necessary apparently to get some city approval either now or prior to plant operation. Meanwhile, work will proceed on construction in the very near future. Shop drawings for imbedded items are due in on May 3, 1976 (working day 342) and allowing ten days for approval and 40 days for delivery, imbedded items for concrete work should be on the job by July 14, 1976 (working day 392). It is expected to require about 60 working days to build the structure which brings completion of the building without equipment to about October 7, 1976 (working day 452). Flow equipment is anticipated to be on the job by December 6, 1976 (working day 493) with installation taking about 15 working days which brings completion of the plant to December 28, 1976 (working day 508). Thus, the plant will probably begin operating sometime shortly after the first of the year, 1977.

hold this

While in Tulsa we discussed signing off the drawings. The Claremore Industrial Authority has reviewed all the working documents and passed a resolution approving them.

To close out our monitoring at Fleming's office, we discussed several other items which are reviewd at random below.

- Roof openings have not yet been totally located. Roof hatch access has been located and other openings will be spotted as soon as needs are established. Mr. Sellers said that this is not a serious problem at present.

not all located - process equipment remains.

- The working drawings have not been completely brought up to date to reflect current design conditions and as-built status. Mr. Sellers reports these are presently being revised.

Dwgs. are up to date

- The cat walk matter is not yet resolved. Continued evaluation is in work particularly to determine frequency of need for change of filters and maintenance of equipment. As a side issue of this matter, if any extensive and regular maintenance or replacement is needed on the roof top units, there should be provided roof access openings large enough to move material and equipment through the hatches. Otherwise, it will be necessary to hoist from outside the building which is prohibitively expensive.

not resolved

- Mr. Nyman is following up the approval checklist. Most approvals have been given with the exception of air and quality control. The forms for this approval request are being prepared by Mr. Nyman now.

- Still do not have the air quality approval by Oklahoma Dept. of Health.
- Report will be comp. in 10 wks.

- Revised by ARSTED (2 months)
- Will be submitted to air quality by Aug 2, 1976 (60 D)

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6/3/76

- Internal subjective approvals on items are presently being obtained. Very few selections remain. One of these is choosing carpet. This will be done shortly.

  All selected except floor covering & carpet chair etc.

- A Claremore project file (COP) is being prepared. The file becomes especially important now that the Claremore plant management team has been set and will be moving to Claremore sometime within the next four months. I strongly urge this file be kept as comprehensive and as complete as possible so that during the initial run-in of the plant particularly there will be no major informational gaps.

  Greg doing same - no major work as yet.

- It is the intent presently to prepare a utility map showing location of all utilities brought to and across the site. I, again, stress the importance of this since operationally it often is necessary to locate these lines.

  Greg will do.

- Utility service to the building site has now been set and all lines are sized to desired conditions.

  —

- Electrical service and charge elements to the Satellite plant are still being resolved. Again, it is important to remember that power will be needed as early equipment begins to arrive at the site.

  —

- The matter of gas service has been discussed briefly above. It is important to clear this work and get it underway.

  —

- Mr. Sellers will provide copies of all subcontractor agreements to Mr. Nyman for the COP file.

  A.H. doesn't have yet. Jim Sellers will provide

- The project building permit has been obtained.

- Mr. Nyman and Mr. Sellers have established cutoff dates on various areas of the building design. These are, of course, constantly being updated since at this stage many of the decisions are difficult to pin down exactly. It is important that targets be set so any revisions can at least be evaluated relative to their impact upon the cutoff dates.

  Fair shape

- Procedures have been established between Fleming and Burgess Norton regarding changes to the work.

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6/4/76

- A new network plan for the building construction which supercedes the first issue was distributed and I have marked this issued as of 4-8-76. This network makes some basic logic revisions to pull project completion targets back in line. It appears to be an acceptable plan of work.

On Friday, April 9, 1976 (working day 326) Mr. Nyman and I spent the morning reviewing general job progress on the master network. Presently building work, as noted above, is moving well and most equipment acquisition also seems to be in reasonably good shape.

We made a detailed evaluation of the die design, along with acquisition of related equipment. Presently it appears that the design will be complete Wednesday, April 14, 1976 (working day 330); proposals would be due in in two weeks, with another week to let the contract. Fabrication would be complete approximately three months later - on August 10, 1976 (working day 411). This appears to be a reasonably optimistic schedule but presently it is acceptable and will get the equipment to the job at the needed time.

Hold Aug 10, 76 for comp fab. - design late - extend let on May 18, 76 (353) 66 419 Aug 20, 76 Tiny from Aug 10, 76

A major share of our morning work revolved around preparation of a management by exception technique to monitor acquisition of tooling. Mr. Nyman has broken the total project into several machine centers. I suggested he and his staff identify three elements within each major machine center.

A. The equipment needed

B. The internal tooling needed

C. The external tooling needed

We ran an experimental simulation of this technique on the semi finished grind line and then set the steps necessary from identification of the internal tooling items on through to where they were made operative in the new plant. These steps include:

- Identifying internal tooling needed
- Cataloging tooling
- Approving purchase
- Placing order
- Fabricating equipment
- Delivering equipment

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- Storing equipment
- Setting equipment
- Making equipment operative in place

These steps are shown on sheet 1 - Tooling Checklist for Satellite - MX System dated Issue #1, April 9, 1976. On this sheet we established a line for target dates to be defined and a line for actual dates to be tabulated. Working with color coded lines and using the isoquant (IQ) system, gives a starting basis for generating the management by exception monitoring tool needed for an ongoing evaluation of internal and external tooling progress. Probably the same technique could be applied to the acquisition of machines. It might be that this information could be put on smaller sheets to be contained in notebooks. The technique was reviewed in depth with Mr. Bob Weilert and he felt it had considerable merit. He and Mr. Nyman will refine the system and put it into work as quickly as possible.

At the afternoon session we reviewed one of the sound on slide sequences, that had been prepared for the PET program under the direction of Mr. Harlan Oelkhaus. The pictures and sequencing look good and we spent some time critiqueing the techniques used. Overall I think the approach is excellent and should be of great help in training plant staff.

We also monitored the network model for the training program, Issue P1 dated February 6, 1976. It appears presently all major tasks are meeting targets between early and late starts and finishes. The critical line of action is the preparation of the SOS basic course, along with the script. This work is meeting targets but Mr. Oelkhaus feels it is going to be nip and tuck to complete so as to initiate the first training programs in early July. With present progress this should pose no major problems.

To close out our session, we made a basic review of various elements involved in management interrelationships at the Claremore plant. This was an informal discussion which reviewed basic relationships between management and other elements of the organization. I strongly recommended to Mr. Nyman that a careful review of the desired organizational structure be established and reviewed with all concerned so that responsibilities and authority are clearly defined. This is particularly the case since there must be maintained a strong relationship between the Geneva operation and the plant in Claremore, particularly during startup. Since the material covered was of a general nature, it will not be reviewed in depth in this report.

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It is anticipated the next monitoring will be held the first week in June - probably on Thursday and Friday, June 3 and 4. I shall be in touch with Mr. Nyman regarding planning for this monitoring.

Ralph J. Stephenson, P.E.

RJS
m

To: Mr. Arnold Nyman
Mr. Warren Rasmussen

Send original to Arnold N. @ Box 188 Claremore Oklahoma 74017
1 copy
Send 1 copy to Warren Cornman @ Geneva Illinois

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

June 15, 1976

Subject: Monitoring Report #8

Satellite Program for Machine Products Division (MP)
Claremore, Oklahoma

Burgess Norton Manufacturing Company
Geneva, Illinois

Project: 75:38

Dates of Monitoring: June 3 and 4, 1976 (working days 364 and 365)

Target date of first equipment arrival: August 16, 1976 (working day 415)

Target date for office occupancy: August 2, 1976 (working day 405)

Target date for activation of entire new facility: December 16, 1976 (working day 501)

Actions taken:

- Inspected project and site
- Reviewed job progress with Fleming Company project manager and job superintendent
- Prepared summary diagram of remaining office work
- Reviewed all potential problem areas in completing building work
- Reviewed construction progress on Anderson Blvd.
- Evaluated progress on equipment deliveries
- Prepared network for fabrication of die set
- Evaluated pre-employment training, orientation program and tooling and equipment procurement progress
- Evaluated overall job status

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

General Summary

7/29/76

Work at this monitoring and review consisted of an inspection of the site in Claremore, Oklahoma on Thursday, along with a detailed evaluation of the current job status. Friday was devoted to work in the Geneva, Illinois office where we basically were concerned with tooling, equipment and the move by Burgess Norton into the new plant.

Briefly, field progress continues good, although there are, as with most projects nearing occupancy, some problems that should be given prompt attention. Current status of the project shows that about 40% of the floor slab on grade has been poured, most of the major pits and below grade construction have been completed, flumes are presently being installed, most exterior concrete sill walls are erected and installation of exterior metal panels is to begin about June 7, 1976 (working day 366). Panels have been held for installation so as to allow interior work to proceed with as much natural light as possible. There have been some interior work damage problems due to high winds and rain with the building being open. Office close-in is underway with exterior metal studs being erected and roofing due to begin within the next few days.

100% except [illegible]

80% comp on ext/int

As part of our work at Claremore, a small summary diagram of the office was prepared and it appears we can expect completion of the office by the current target date of August 2, 1976 (working day 405).

Now 8/9/76 (410)

Work on the waste treatment plant has not yet begun. Embedded items are still due in on July 14, 1976 (working day 392) and it is expected that work on foundations will begin on July 7, 1976 (working day 387). Flow meter shop drawings from Envirex are not yet in Fleming's hands and presently this is the waste treatment element that will be the determinate as to when the plant can be fully operative. However, it appears that Burgess Norton can run influent through the waste treatment plant without the use of metering equipment. I suggest that this matter be given some attention over the next few weeks since any confrontation with environmental problem areas should be watched carefully. Community relations between Burgess Norton and Claremore are presently excellent and should be maintained at this same high level. In brief, in my opinion, it would be wise to expedite construction of the waste treatment plant once work gets underway.

Not std. will begin 8/11/76 (412)

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In the plant proper, work has proceeded relatively well on the floor slab on grade. Flumes are on the job, one has been installed, the other is currently being installed. These are large pieces of equipment and they, along with other elements, have slowed installation of the floor slab on grade. We discussed the completion of the remaining approximate 60% of the slab on grade and decided that within the next two weeks all information would be available; allowing another two working days to obtain special anchor bolts and ten more working days to pour out, slab on grade is expected to be complete by July 7, 1976 (working day 387) which is approximately ten working days behind the Fleming network plan.

Another area in the plant that has shown signs of lagging is the mezzanine. It currently is about 24 working days behind the target date that had been set for it. The mezzanine structure and deck were originally to be set no later than May 10, 1976 (working day 347). Presently it appears that the structure and deck will be set by about June 14, 1976 (working day 371). Fleming has done a good job of working around the various problems that have delayed mezzanine construction. Thus, the lag is in desired logic rather than in necessary logic so should not have a serious impact upon finishing of the surrounding areas.

A portion of our detailed review of services to the site and building considered the present status of power, water, gas and sewer from the building to the property line and from the property line to the source of supply or discharge. Although there does not seem to be any major difficulties in meeting our current targets, I suggest each of these services be given very careful attention from here out since they represent critical linkages with the plant to needed facilities.

So far as power is concerned, primary transformers are now expected to be on the job as early as June 25, 1976 (working day 380) or as late as July 9, 1976 (working day 389). This includes some additional switchgear and smaller transformers. Activation of the entire electrical system is anticipated by July 27, 1976 (working day 401). Therefore, it was decided that we would aim for provision of power metered by Burgess Norton from the power company no later than July 9, 1976 (working day 389). To accomplish this, primary cable must be brought in from the power drop to the meter base. There, it must be connected to the primary cable going into the building. It was decided tentatively that a 250 amp cable would be satisfactory. This is currently available. It was agreed that Mr. Nyman will discuss the matter in detail with the mayor, Mr. Wagner, Mr. Hollway and Mr. Wiley to establish a firm date for provision of Burgess Norton metered power.

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Power company meters are not expected to be available for 11 or 12 months.

Sprinkler system work will also be critical and it is anticipated that work on the system can begin very shortly. There has been a problem in timing of construction of the loop and this construction will now be delayed beyond the original expectations since there are some financing and right-of-way difficulties. It should have a minor impact upon the plant although as was pointed out, if the delay to installation of the loop extends beyond the end of the year, there may be some difficulties with insurance coverage. Again, as with power, I suggest that constant attention be given this matter since the complete sprinkler system is a critical part of the total installation.

Water will be available from the new line in Anderson Blvd. after the water line to the building is installed on or about June 11, 1976 (working day 370). The line in Anderson Blvd. has been tested and is now available. The sewer line in Anderson has been installed and tapped to its outfall. The line from the building to the sewer in Anderson Blvd. will be installed by June 11, 1976 (working day 370).

Installation of gas service is running into some easement problems and presently there is a delay in start of work. The gas company estimates that it will take about ten working days to install and test the line. It was determined at our meeting that service will be needed no later than September 27, 1976 (working day 444). Thus a decision on where the line is to be located to the site must be made no later than, and hopefully before, September 1, 1976 (working day 427). We should be very careful to check whether or not an alternate location of the gas service will be under Anderson Blvd. and if it is, install it before paving begins.

Overall, installation of utilities to the property line and from the property line to the building is becoming critical and should be given careful and immediate attention. This is particularly so since site work will begin in the very near future. Site work to now has been held pending cleaning up and installation of Anderson Blvd. Site cleanup is presently underway but paving of Anderson Blvd. has not yet begun. Therefore, it may be necessary to start site work before paving of the road is started or completed. This matter should be given decision-making attention since the plant offices are going to be occupied on August 2, 1976 (working day 405) and access to the plant, as well as parking and service roads, should be available.

I recommended to Mr. Nyman, Mr. Sellers and Mr. Allen that they talk over the matter of site work and make basic decisions now as to when it will start and how it will proceed. This is also important in relation to

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bringing equipment into the plant. It will be critical to have a good access road since some of the early equipment is very heavy. In overview, Anderson Blvd. is becoming an extremely important part of the overall access picture. Conversations with Empire Construction Company, contractors for the road, indicate they will be complete sometime the middle or end of July. In my opinion, this is not an adequate answer and I suggest strongly that conversations with the agency that is employing Empire to build this road be held for assurance that suitable target dates will be met.

In the plant areas, electrical contractor is planning to begin his overhead work on Monday, June 7, 1976 (working day 366). Roof top units are about ready to be set and after they are installed, a decision will be made on the catwalk installation.

Presently it would be wise to wind up all pending items that restrain any installation of work overhead whatsoever. Apparently there are still a few related decisions needed and it would be wise to review them, much in a manner as we have concentrated on the floor slab on grade. It was agreed these would be given heavy attention over the next couple of weeks.

Most equipment deliveries are in good shape. A check on the emergency generator delivery by Mr. Sellers indicates it will be on the job about September 1, 1976 (working day 427). In the office, furnishings are being selected and aside from some minor color and material items, work there is in fairly good shape.

The occupancy schedule for the office indicates that by August 2, 1976 (working day 405) five people will be at the office. By the end of August an additional three will be occupying space there and by the end of September another three, bringing the total to eleven. This office is important to the initial work at the plant by Burgess Norton. Therefore, all services to the office should be considered to be available by the initial target move-in of August 2, 1976 (working day 405).

Reviewing the items in Monitoring Report #7 on pages 6, 7 and 8, we find the following:

- There still remain some process exhaust openings to be located in the roof. There are also other minor holes to be spotted but presently this is not causing any major difficulty.

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- Mr. Sellers reports that working drawings have been substantially brought up to the as-built point.

- The catwalk matter will be resolved when the roof top units have been set.

- Air and quality control approval request is still in work. The report should be complete and ready for corporate review in ten working days. This will be submitted to the air quality group by August 2, 1976 (working day 405) and approval should follow that submission.

- All items have been generally selected except for furnishings and floor covering at the metallurgical chemical lab.

- The Claremore project file (COP) is being worked upon as time permits. Again, I suggest this be given attention since as take-over of the plant proceeds, it will become more and more important to have a full set of documentation.

- All utilities are presently being located by Mr. Greg Wiley.

- Utility service to the building site has been discussed above.

- Mr. Sellers said he would provide Mr. Nyman with copies of all subcontractor agreements.

On Friday, June 4, 1976 (working day 365) Mr. Nyman and I spent the morning in the home office in Geneva reviewing the master network for current progress. Presently building work is moving well in accordance with this master diagram and there has been a slight improvement in the progress of equipment acquisition over the past month and a half.

Because of the critical nature of die set fabrication, Mr. Nyman, Mr. Peterson and I prepared a diagram of the fabrication process for the new die set. It indicates our present target of August 10, 1976 (working day 411) can be met. This should allow adequate time to ship the die set to the Geneva plant, test it and then get it to the Claremore plant in good shape.

We diagrammed the die set fabrication on the blackboard in the conference room and I made a partial copy of it but was not able to complete the copy. Mr. Nyman was left the small sheets for the diagram and will complete them for use internally.

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Next, we met with Mr. Bob Weilert and Mr. Short to monitor acquisition of tooling. Mr. Weilert has assembled a management by exception technique by which he can accurately evaluate the current status of all of the internal tooling items to the point where they become operative in the new plant. Generally internal tooling is currently in good shape although I did suggest a separate column be provided for identification of the date on which purchasing actually issues a purchase order for the equipment as compared to the date on which they were authorized to buy the equipment. This is to insure that no internal slippage not identifiable will occur in the actual purchasing of the equipment.

As the staff moves to Claremore and begins working at the new plant, it will be increasingly important that close liaison be maintained with assisting departments back in Geneva. One that will be critical for proper startup of the new plant will be purchasing. I suggested to both Mr. Weilert and to Mr. Short that they maintain a constant check, perhaps as often as once per week by telephone, to review current status of the item acquisitions by purchasing.

Mr. Short is to acquire equipment dealing basically with quality assurance and control. He tentatively decided it would be wise to utilize a system somewhat similar to the one Mr. Weilert is using to maintain consistency of documentation and plans to put this technique into implementation shortly.

I cautioned all concerned that as they move out of Geneva and become less visible by having their headquarters location in Claremore they will have more and more pressure to move anything that belongs to Claremore and is presently in Geneva out of Geneva to Claremore. Thus, there will be an increasing demand to find places to put things in Claremore. This process is already evident in the case of material to be used for the training program. There are temporary storage facilities to be had in Claremore but it would be wise to make certain that minimal multiple handling of equipment, particularly heavy pieces, is maintained.

After reviewing internal tooling, we went over the PET program status. Mr. Oelkhaus said that the first phase of the program involving some purchased sound on slide presentations and other prepared graphic material is in excellent condition. The first phase is due to go on July 7, 1976 (working day 387). The second phase of the program using sound on slide material and manuals is also in good shape and will be ready August 16, 1976 (working day 415).

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Mr. Oelkhaus did express some minor concern about completing his sound on slide material but feels it he can obtain adequate technical guidance in writing the remaining scripts, he should be able to complete in time.

Our discussion brought out that there are several areas that are to be managed concurrently by Mr. Oelkhaus, including the following:

- Establishing purchasing procedures for Claremore
- Setting accounting procedures, primarily cost accounting, probably in conjunction with Geneva
- Establishing office service policies
- Establishing personnel policies
- Establishing production control system
- Actively participating in teaching PET classes

He has set a preliminary target to establish purchasing and accounting procedures by August 2, 1976 (working day 405). Office service policies will be set by October 1, 1976 (working day 448). Personnel policies are generally established now. By October 4, 1976 (working day 449) the production control system will be needed. Teaching will be an ongoing process until others can begin assisting in the teaching work.

It appears to me that Mr. Oelkhaus is going to be an extremely busy individual and I would tend to suggest the duties outlined for him at Claremore be reviewed to insure that there is not an excessive amount of overlapping that will create difficulties in achieving initial objectives.

Starting up the Claremore plant will be a very exciting period, but it also will be extremely demanding upon various managers' time. Careful attention must be given to proper distribution to duties and assignments. It would be of great help if Geneva management can lend leverage assistance as needed in the move-in and activation of the Claremore plant.

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A summary of the entire project presently indicates that construction and tooling up of Satellite is moving well in accordance with the established standard of performance. Still to be watched are installation of the Anderson Blvd., bringing utility services to the boundary line and to the building proper, installation of site work, closing in of the building, completion of the office for early occupancy and constant following of equipment procurement.

I am impressed with the management group assembled to run the Claremore plant and am particularly pleased with the enthusiasm and vitalty that apparently exists among members of the team. Anything that can be done to stimulate this and to motivate them by constant challenge will be healthy. This, of course, will be the responsibility of both the Claremore staff and the Geneva management group.

We shall monitor the project again in late July and I shall be in touch with Mr. Nyman shortly to set the meeting date in Claremore, Oklahoma.

Ralph J. Stephenson, P.E.

RJS
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To: Mr. Arnold Nyman
Mr. Warren Rasmussen

RALPH J. STEPHENSON, P.E.
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August 5, 1976

Subject: Monitoring Report #9

Satellite Program for Machine Products Division (MP)
Claremore, Oklahoma

Burgess Norton Manufacturing Company
Geneva, Illinois

Project: 75:38

Dates of Monitoring: July 29 and 30, 1976 (working days 403 and 404)

Target date of first equipment arrival: August 16, 1976 (working day 415)

Target date for office occupancy: August 2, 1976 (working day 405)

Target date for activation of entire new facility: December 16, 1976 (working day 501)

Actions taken:

- Inspected project site
- Reviewed job progress with Fleming Company project manager and job superintendent
- Evaluated current job status
- Evaluated progress on equipment delivery and installation
- Reviewed current status of primary power to building

General Summary

The two days of monitoring and review were spent in inspecting the site and building, evaluating current status of the construction work and discussing in depth installation of ventilation, piping and electrical systems from the building service loops to individual pieces of equipment.

Generally field progress on basic construction is in good shape, although because of some minor delay problems with deliveries and installation

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of electrical service from the property line to the metering point, the office area will now be ready for occupancy about a week late. Present plans are to move into the office on or about August 9, 1976 (working day 410). Punching out the office will start on August 5, 1976 (working day 408). There are some revisions to be made at the conference room to the end walls and this refabrication and installation are presently in work. Carpet for the office was delayed en route but delivery is expected momentarily. There is a possibility that one of the rolls of carpet has been lost and this is being checked out.

In the plant, work is proceeding well with equipment beginning to arrive on the job site. There is an increasing need for permanent power to be provided for many reasons; one of the more important is to obtain adequate light in the plant area so work there can proceed as the building is closed in.

The problem on electrical power has been that the electrical workers for the city who were going to install the service from Anderson Blvd. to the meter location on site have been on a deferred work basis or strike for about a week. This has prevented this work from being completed and is a major source of delay to installation of the permanent power. A more detailed review of this matter will be covered below.

The waste treatment plant continues to be deferred but now is expected to start on August 9, 1976 (working day 410), when it is anticipated that early work can proceed without interruption. The target completion date for the waste treatment plant is still the end of the year since clarifier equipment will not be on the job until December. Embedded items were delivered, found to be in some cases, incorrect and are now being refabricated. They will be on the job August 11, 1976 (working day 413). The PH recorder, flow meter and sewage sampler shop drawings have been submitted and the equipment is anticipated on the job in mid-October. Thus, it presently appears there should be no major delay to activating this plant by the beginning of next year.

Reviewing each major sector of the project in more detail, we find the following.

Off-Site Work

The easement problem for gas and sprinkler water service to the site has still not been resolved and is currently pending settlement with

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the owner of the land on which the easement is to be located. Once the easement problem is settled, it is anticipated that installation of the gas service will take about 10 working days. There is every assurance the gas company will work promptly and vigorously on this so there appears to be no major problem.

Sprinkler work is out for proposals and it should be possible to complete installation of the off-site sprinkler loop sometime this year. The domestic water line is presently complete and operative. The sewer is connected and phone company work is expected to be installed, at least on a temporary basis, by the end of next week. The phone company desires to have the entire underground conduit system complete before pulling cable. This does not pose a delay.

Underground power from the present off-site overhead line is a difficulty. As mentioned above, the electrical workers for the city are off work due to a wage dispute and there is no authentic word on when they will be returning to work. To get permanent service it is necessary to install another pole at the service drop on the west end of the site and pull cable through to the meter location near the building. To do this, it will be essential to have cable, terminators, disconnects, splicers and arresters. The present physical location of this material is somewhat obscure due to the work stoppage but it is felt by most knowledgeable people that all of the material is now available.

A good share of our work the first day consisted of developing alternate methods by which we could proceed if various permanent power events did or did not occur. It is most probable that if the electrical workers do not go back to work by August 2, 1976 (working day 405) that permission will be sought by Burgess Norton to contract for installation of available materials by outside contractors and then to be reimbursed for this work by the city through reductions in electrical billing amounts for a given period of time.

It is becoming critical that permanent power be brought into the building since a good share of the work from here on out depends for its quality upon having adequate light by which to work. Also, it is essential for power to be available to activate interior systems at the office and allow the permanent Burgess Norton Satellite staff to move in and go to work at the plant site.

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On Site Work

Paving was started Friday, July 30, 1976 (working day 404) and is expected to take 3 to 5 working days to complete. Most curbs and sidewalks are already installed and rough grading of remaining areas of the site will be initiated shortly. Landscaping and planting are expected to begin after paving is complete. Light poles are on the job and will be installed after the parking lot is striped. There is one special light pole at the office that has still not been received but this is expected to be on the job sometime soon.

Sign installation will begin sometime next week. Mr. Nyman is expected to provide the text for the sign shortly.

As noted above, construction of the waste plant is due to begin early in August, with equipment to be delivered at varying times up through the end of the year. The cooling tower will be on the job August 9, 1976 (working day 410) and will be installed immediately. It was determined that an outside deadline of activation of the cooling tower is October 1, 1976 (working day 448).

Office Area of Building

A review of the office area has been given above and as noted, it will be ready to start punching out within the next three working days. Most work there is either complete or being completed with the exception of miscellaneous finishes and carpet. Wood doors have been delayed and present word is they will be available on August 2, 1976 (working day 405) and should be installed by the end of next week, August 9, 1976 (working day 410). They will be shop finished probably at Fleming's yard and brought to the site.

Installation of toilet room fixtures is presently in work and will be followed by partitions and accessories. Office furniture is due in on September 27, 1976 (working day 444).

Plant Area

At the mezzanine, installation of the mechanical equipment room is proceeding with hot water heaters presently in place. The equipment room also contains compressors, an emergency generator, air handling equipment for the labs, and humidifiers. Most equipment is available and on the job except for the emergency generator and condensers for

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the lab air conditioning. There has been a problem with delivery of this equipment and a decision has been made by the mechanical contractor to go to an alternate make of condenser than originally intended. The original supplier is on strike and his equipment is not available. This alternate selection is available although it may require some additional power service to the equipment served. However, it is quite important that this equipment be put into service and therefore, the switch to the available condenser is desirable. Apparently there is about a week's work in the equipment room to make it operative.

The emergency generator is to be delivered September 15, 1976 (working day 436).

Other work at the mezzanine level is moving quite well with drywall being installed, sash being put in place at the manager of manufacturing's office and work in the cafeteria proceeding well.

At the labs and wash rooms on the first floor most work is in reasonably good condition although plumbing fixture installation and partitions and accessories have not yet been started. Lab ceilings are in work with some painting being complete.

In the plant proper, the entire floor slab has been poured out with the exception of a strip at the dividing partition. Some discussion was conducted regarding this partition and the size of the openings left in it. It was decided that the north opening would be increased in width one panel - about 3 ft. to allow access for the large furnaces that are to be brought in soon.

Roof openings are to be cut as exhaust system installation proceeds. A sizable amount of discussion was held during this monitoring session regarding the nature and location of exhaust vents. This item will be discussed below.

Overall, the building portion of the plant is in good shape. There is about another two week's work to complete mechanical piping loops and at that point, if not before, installation of machinery could start.

General Items

Many miscellaneous topics were discussed in the monitoring sessions. These are covered below at random.

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- Furnishings for the metallurgical chemical lab are scheduled to be on the job in about 12 weeks. This brings them on site by October 26, 1976 (working day 465). This is later than had been anticipated and a delivery review is to be made.

- The COP file is presently in work and being given continued attention by the Burgess Norton staff.

- Revision of flume depths at the filtration tanks is to be made when the filter tanks are delivered and accurate field dimensions can be taken.

- Structural steel for the filter tank deck is available. Precast deck will be field casted.

- Consideration of a plant sign visible from Route 66 is in work. This is a matter to be handled by Burgess Norton management.

- Paving of the turn-around on Anderson Blvd. was completed July 28, 1976 (working day 402). Anderson work is now substantially complete except for curb inlets.

- As-built working drawings are being brought up to date as construction proceeds.

- A decision as to whether cat walks will be installed between roof top units will be deferred until additional roof work has been installed. This matter is still under consideration.

- An air and quality control approval request has been completed and will be submitted next week.

- Mr. Nyman has not as yet received copies of subcontractor agreements. I suggest this be accomplished as soon as possible since the job is rapidly coming to a close and it would be wise to incorporate these as part of the job file.

Installation of Piping, Ventilating and Electrical Services to Equipment

A good share of the second day of monitoring was devoted to reviewing activities required as equipment arrives on the job and installation of services to and from is installed. Basically there are three major

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contractors doing this work - piping, ventilating and electrical. Between them they must install the air, gas, sprinkler, oil, recirculating water, domestic water and bus duct services and connections. We were able to meet with the three subcontractors at the job site and discussed the problems that might be encountered. Of the three, it appears that major difficulties may be encountered in installation of the equipment and services that require venting. The difficulty here consists of obtaining adequate installation information. A detailed discussion with the ventilating subcontractor indicated he needs the following data to properly do his work.

- Dimensional details of all affected equipment including exact location on the plant floor
- Cfm deliveries expected from the exhaust system
- Temperature and nature of the material being exhausted
- Heating, ventilating and air conditioning system details that are an integral part of the equipment, including the exact point of connection
- Manufacturer's recommendations for ventilating the equipment, particularly at the heat treat area.

It would be wise, in my opinion, for the three major subcontractors affected to immediately begin detailed design and detailing of the power, piping and ductwork connections. Equipment hookup is going to be an increasingly critical element over the next few weeks as machinery arrives on the job.

It is presently the intent to hold equipment installation progress meetings once a week to review construction processes and to discuss in detail, progress being made toward installation of equipment. Mr. Nyman, Mr. Weilert and I discussed an equipment installation check sheet to allow close watch to be kept on each piece of equipment as it is brought on the job and installed. This check sheet preparation is a very critical part of the present work and I suggest a high level of priority be given it over the next few days.

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Internal Tooling

A detail review was made of the internal tooling checklist with Mr. Nyman and Mr. Weilert. It appears that overall, delivery of most tooling is under excellent control except for a few minor items. Zip lifts will require a 6 week delivery from July 30, 1976 (working day 404), bringing them on the job by September 13, 1976 (working day 434). There are 19 of these and hopefully they can be installed by September 20, 1976 (working day 439). Equipment of this nature may need additional capacity for plugging in. The matter was discussed briefly at the site with the electrical contractor and should be followed up to insure that adequate electrical capacity is available on equipment or at columns to service the zip lifts.

At the extrusion press, the die set is due in Geneva on August 5, 1976 (working day 408). This equipment will be tried out in Geneva and upon satisfactory performance, reshipped to Claremore. It is in apparently good condition.

While we were discussing internal tooling, the matter of jib crane loads on columns came up. It would be appropriate to recheck the steel section of the present building columns with or without reinforcement to determine if they can carry the jib load expected. This matter will be reviewed with the general contractor.

Dumpers for the anneal and coat areas may be a problem although Mr. Weilert is presently working to resolve delivery of these.

PET Program

A major review was not made of the PET program at this time except to generally confirm that it is moving well and that a high level of student interest is presently being observed. Apparently the program has been well received and moving in good fashion.

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Overall, the project still appears to be moving well although I do want to caution that heavy attention be given to installation of machinery and most particularly, completion of hookup to equipment on a studied, planned, regular, identifiable and predictable basis. This is an area that could get out of hand both from a management standpoint in the field and of course, could have cost implications that would be good to avoid.

It appears that further monitoring of the job probably will not be necessary except under special conditions that may arise. I would like to take this opportunity to compliment all those who have been involved in this program, particularly the project staff for Burgess Norton. They have done an excellent job and it has been a pleasure working with them.

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