Puerto Rico

Memos
XX Water

JAN 18 1973

File

cc: George Wood
Bill Krasnow
Al Hanson

17 January 1973

Ed Schwartz

Legal

5500

RAMEY AIR FORCE BASE

I received a call from Mr. Pfiemer of the Air Force on Tuesday afternoon to inform me that he now knows the situation concerning Ramey and the Port Authority.

It seems that two agreements were entered into between the Air Force and the Port Authority concerning Ramey. The first agreement is, in essence, a "joint use" agreement under which both parties agree to share the use of the airport facilities. The second agreement is a lease for approximately 450 acres which enables the Port Authority to develop this area of Ramey and under which the Air Force agrees to furnish utilities to the Port Authority so long as the Air Force controls the Base. The lease can be terminated upon six months' notice, except if the Port Authority defaults on the lease agreement, the Air Force can terminate both the lease and the joint use agreement. The lease does not specify the quantity of water to be supplied; however, it seems that the entire lease references the use of land within Ramey and, therefore, it may be proper to conclude that the utilities can service only this land.

I urged Mr. Pfiemer to, in turn, urge Major Medlock (sp?) who is the Head Engineer (or something like that) at Ramey, to obtain all the information which Mr. Pfiemer will require in order to consider PRIDCO's request for water. The prior letter submitted by PRIDCO was not acceptable because it merely sought information and was not a definitive request for water.

Once Major Medlock has this information, he will submit it to the Military Air Command at Scott Air Force Base in Illinois which, in turn, will forward it to Mr. Pfiemer's office.

I conclude from this discussion that we should not be optimistic about obtaining water from the Air Force or from the Port Authority, but rather should work with PRIDCO to satisfy our water requirements from Aguadilla.

/sam

Puerto Rico

mems
XR Equipment

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DEC 27 1972

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PUERTO RICO
DIGITAL MAYNARD
MSG NO 8 12-19-72

TO HIRAM QUINONES PR

FR G. WOOD MAYN 1-4

CC G. LORDI 1-4 MAYN
R ESTEM PR
R SAMBOLIM PR
DON PUCCI
BILL KRASNOW PARKER ST MAYN
F BOWERS PR
D DEMORANVILLE PR
R GUZMAN PR
DR CULYER CDM
A HANSOM PARKER ST MAYN
W. HANSOR 1-4 MAYN

DEC 19 10 23 AM '72

BOB SAMBOZIH TELLS ME THAT YOU HAVE SOME ONE IN MIND TO RUN THE WASTE TREATMENT PLANT. AS I UNDERSTAND IT YOUR SCHEDULE IS APPROXIMATELY AS FOLLOWS:

MAN STARTS ON OR ABOUT JAN 2ND

ALL ABOUT TWO WEEKS FOR HIM TO GET AQUAINTED.
GERRY LORDAAVAILABLE FOR 3-4 DAYS SOMETIME AFTER JAN 15TH FOR THOROUGH TAINING AND INDOCTRINATION.

OPERATOR RUNS A TWO MONTH DATA STUDY ON THE PROCESS AND WASTE TREATMENT PLANT.

AFTER THIS WE CAN ANALYZE THE DATA AND MAKE CHANGES, IF ANY, TO THE EQUIPMENT.

I NOTICE FROM LILLIAN'S REPORTS AND YOUR SEVERAL MESSAGES THAT YOU HAVE EVERYTHING OPERATING ON A STEADY, CONTROLLED BASIS. I HAVE CHECKED ON THE LOADING OF THE FILTER PUMP AND THE SUPPLIER RECOMMMENDS THE FOLLOWING-

VALVE THE OUT PUT OF THE PUMP SO THAT THE RECIRCULATION VOLOCITY DOESN'T STIR UP THE SOLUTION AND HAMPER THE SETTLING.

WILL YOU GIVE THAT A TRY AND LET ME KNOW IF IT HELPS.

ALSO LET ME KNOW IF THERE'S ANYTHING ELSE ANY OF US CAN DO TO HELP YOU IN ANY OTHER WAY.

THNAKS

REGARDS
SLG
NNNN

Puerto Rico DEC 5 1972

memo file

digital INTEROFFICE MEMORANDUM

XR Land

TO: Al Bertocchi
cc: Pete Kaufmann
Dave Knoll
Bill Hanson
Al Hanson

DATE: December 4, 1972

FROM: Ed Schwartz

DEPT: Legal

SUBJ: TRIP REPORT -- San Juan/San German, Puerto Rico
November 28 - 30, 1972

The principal purposes for my recent visit to Puerto Rico were twofold; first, to move PRIDCO to the point of granting DEC an option (without cost) to purchase approximately 50 acres of land in Aguadilla at a per-acre price which included water (approximately 200,000 gallons per day) and secondly, to determine the most appropriate way to incorporate the 38,000 square foot building which DEC de Puerto Rico presently occupies in San German on a month-to-month basis, into our existing ten-year lease for the 120,000 square foot building. I also hoped to have our Puerto Rican counsel confirm my intended approach to avoid certain prohibiting legislation and still enable the employees of DEC de Puerto Rico to participate in the Digital Equipment Corporation Stock Purchase Plan, if the Operations Committee and the Board of Directors of DEC so approve (a proposal will be forthcoming by proponants, Jaime Ferra, Dick Esten and Bill Hanson).

1. 50-Acre Site Option - The president of PRIDCO has assured me that by December 14, 1972 PRIDCO will have decided that it can or cannot reach an agreed purchase price per acre with the existing owners, or whether PRIDCO must commence expropriation proceedings to acquire this land and also what DEC's share will be of the cost of providing the necessary water to the site. I expect that on and after December 14, 1972, serious and final negotiations can be conducted with PRIDCO to grant to DEC an option at the best possible per-acre purchase price. I had to pressure this deadline under the statement "risk no DEC expansion on this land."

2. 38,000 Square Foot Building - These negotiations became a windfall to DEC. I hope to obtain within the next four weeks from PRIDCO on the basis of our bringing the 11/05 line to Puerto Rico and installing a portion of it in the 38,000 square foot building and in the existing building an agreement calling for the following:

   A. Extensive repair of the 38,000 square foot building with no increase in rent above the existing $.75 per square foot per year.

   B. Incorporation into our existing lease, but cancellable if we choose to expand our existing plant, a ten-year commitment for this 38,000 square foot building.

C. Extension of our option termination date on two of the three lots presently standing across the street from our existing building for an additional two years (from March 1974 to March 1976),

D. Incorporation of the remaining lot of these three lots under our existing lease without an increase in rent in order to have PRIDCO further agree to grade this lot for additional parking if we so choose,

and of greatest importance,

E. The granting to DEC of an additional incentive sum of approximately $100,000 for all new hires after September 30, 1972 up to a total of 400.

3. Stock Purchase Plan - I did meet with our attorney in Puerto Rico and believe that my plan is viable. I did not take the remaining step of speaking with the credit union which will be involved in this process because I felt it would be premature to do so prior to the time the Operations Committee has approved the basic proposal.

/sam

Puerto Rico
DEC 5 1972
Al Hanson memo
XR Pollution Control

digital INTEROFFICE MEMORANDUM

TO: Bill Krasnow
cc: Those Listed

DATE: 28 November 1972

FROM: George Wood

DEPT: Process Engineering

SUBJ: MINUTES OF WASTE TREATMENT MEETING - 11/22/72

Puerto Rico:

The most recent trip of G. Wood, G. Lordi, and Bill Krasnow to Puerto Rico was discussed. A trip report is attached and a summary follows:

- Hiram helped set up a program to get back on line.
- All mechanisms are functioning.
- All pH equipment is functioning.
- New copper analysis equipment is in, functioning and people trained.
- A combined process "contents" chart was established (first pass).
- Copper dropped from the 25 to 60 ppm range to 1-5ppm with some results below 1ppm.

To succeed in the future:

- Hiram will hire a waste treatment plant operator.
- Gerry will spend some time with Hiram helping to train him.
- Dick Esten will buy a portable pH controller for back-up.
- George, Gerry, Bill and Hiram will analyze 2 months worth of data collecting under control and either "bless the plant" or revise it.
- Bill Krasnow will follow-up with Aquaductos on the by-pass pipeline and effect the change if it becomes necessary.

cc
file
~~Bill Hanson~~
~~G Wood~~
G. Lordi
~~B. Krasnow~~

Maynard

C.D.M. and Lancy Labs have reviewed the data and discussed it with Bill Krasnow and Gerry Lordi by telephone.

Bill will endeavor to get a first pass report from Lancy on or before Dec 15th. This report should indicate:

. Which general direction they have adopted.
. What the pros and cons were that led to that decision:

i.e., cost
flexibility
ability to expand, etc.

George Wood has agreed to review Don Pucci's look at the process 5 years from now and send it to C.D.M., Tom Whalen, and Dr. Lancy so as to guide them in their decision.

The proposed calendar of events is as follows:

. Prior to Dec 15th - Receive a first pass approach from Lancy
. Dec 15th A.M. - Wood, Pucci, Lordi and LaBate review the report
. Dec 15th-1:00 P.M. (Conf Room C) - Next Waste Treatment Meeting
. Dec 18th & 19th - Meet with Lancy to review his approach
. Jan 15th - Lancy Report due to C.D.M.
. Mar 15th - C.D.M. preliminary report due to the State.

Note: Gerry Lordi will be getting specific data on the chemical content of propriatory items to Dr. Lancy by Dec. 8th.

Errata: As of Nov 27th, Bill Krasnow advises: Both C.D.M. and Lancy Lab's people will be in the plant the week of Dec 4th to discuss flow diagrams of the processes. Please try to be available. The date will be firmed up shortly.

The Dec 18th and 19th meeting with Dr. Lancy will be moved up to 1:00 p.m., Dec 19th. Obviously we will have to re-schedule other meetings. All will be arranged after the Dec 4th meeting.

Distribution:

Al Hanson
Bill Hanson
Gerry Lordi
Ron Cajolet
R. Sambolin
J. Harrigan
D. Esten
Les Goldman
John LaBate
Don Pucci
Hiram Quinones

Puerto Rico NOV 17 1972 memo

digital INTEROFFICE MEMORANDUM

TO: Al Hanson

cc: Ed Schwartz

DATE: November 15, 1972

FROM: Phil Markell

DEPT: Legal

SUBJ: REMY AIR FORCE BASE - PUERTO RICO

Bill Flynn has told me about the people to communicate with in Washington with regard to Remy. They are Lewis E. Turner, Deputy Assistant Secretary for Installation, Department of the Air Force, Department of Defense Building, Pentagon, Washington D.C. 20330 and Lt. Col. Steryar S.A.F.L.L.P., Director of Legislative Liaison, Department of the Air Force, Department of Defense Building, Pentagon, Washington, D.C. 20330.

/jlh

CC
✓ file.
Bill Krasnow.

NOV 7 1972 Puerto Rico Maynard

memo X R Waste Treatment

digital INTEROFFICE MEMORANDUM

TO: Al Hanson
Bill Krasnow
Gerry Lordi
Bill Hanson
Ron Cajolet
Jack Harrigan
John LaBate
Les Goldman
Dick Esten

DATE: October 31, 1972

FROM: George Wood

DEPT: Process Engineering

SUBJ: MINUTES OF WASTE TREATMENT MEETING - 10/24/72

Puerto Rico

Since the last meeting, G. Wood, G. Lordi and Bill Krasnow have gone to Puerto Rico During that visit a program was developed to calibrate and put the waste treatment plant in good running order.

The program and a current status sheet are attached as a supplement to these minutes.

Maynard

People from C.D.M. and Lancy Labs were in the plant on October 19th and working with G. Lordi and Bill Krasnow. They collected samples, data and other information. Lancy Labs has estimated that it will take two weeks. To construct a few diagram so we should expect to see it about November 1st.

It is further expected that a month after that (about December 1st) Bill Krasnow will set up a working meeting to:

1. Analyze and suggest changes to the "dirty" processes.
2. Review the M.L. proposal processes.
3. Take a look at possible chemical changes 5 years out.
4. Establish what further information is needed for the March 15th state report.

Don Pucci is preparing data forecast possible changes during the next 5 years.

NEXT MEETING:

MONDAY, NOVEMBER 20th - 10:30 A.M. - CONFERENCE ROOM C

CC
file.
Bill Krasnow.
At some point in time this type of problem has to be turned over to the operational people.
Ann H.

DEC 5—(641)—1043D—R271

Maynard
✓ Puerto Rico

Al Hanson
memos
XR Waste Treatment

digital INTEROFFICE MEMORANDUM

TO: DISTRIBUTION

file

DATE: September 25, 1972

FROM: George Wood

DEPT: Process Engineering

SUBJ: MINUTES OF WASTE TREATMENT MEETING - 9/19/72

MAYNARD

1. As a result of our trip in to the State Offices:

   New rules do not have the maximum solubility reference. We are still under order to be in control by March 1974. Currently the plan is to control all industrial waste and discharge it into the river.

2. After Dr. Lancy's visit to DEC both he and Bob Marini of CDM have written letters indicating their desire to work together. A follow-up meeting will be held at Lancy's Laboratory in Pennsylvania on or about October 2nd. Meanwhile, Bill Krasnow will place a purchase order with CDM to get the project started.

   DEC's reason for having Lancy Labs and CDM work together are to take advantage of CDM's project management ability and treatment, background and supplement that with Dr. Lancy's specific technical background in the treatment of industrial chemical waste. In that regard CDM will manage the project, make all final decisions and hold responsibility for successful completion. We, of course, will have every opportunity to review proposals and throw up red flags.

PUERTO RICO

George Wood brought up the situation in Puerto Rico, which in summary is as follows:

1. 14 months after installation we don't know if our effluent is good or bad.

2. Approx. 6-8 months after hiring a consultant Ramon Guzman we still don't know if our effluent is good or bad.

3. 4 months after our meeting in which we structured a plan to solve the problem by:

   Having Guzman report directly to Hiram
   Re-establishing test requirements offering test methods etc.

   We still don't know whether our effluent is good or bad.

4. San German is in the final building stages of their new sewage treatment plant (completion by early '73). Our effluent (if we believe all the numbers) could indeed affect the operation of that plant.

   To forestall any civil action against the plant, George Wood, Bill Krasnow and Gerry Lordi will go to Puerto Rico late in October to start an analysis and plan a program for getting answers and taking corrective action if required.

Puerto Rico

memo
XR Safety

digital INTEROFFICE MEMORANDUM

TO: Hiram Quinones
Puerto Rico

DATE: 29 August 1972

FROM: Ralph Renzi RR

Central File

T&M 9/26/72

DEPT: Safety and Loss Prevention

SUBJ: SAFETY AND INDUSTRIAL HYGIENE SURVEY

On July 17, 18, 19, and 20, 1972, a Safety and Industrial Hygiene Survey was made of the Puerto Rican facility to determine traumatic injury and health hazard potentials and the corrective action to be taken, if needed.

For clarity, this report is divided into the following sections:

I. Noise Survey
II. Lead-in-Air Survey
III. Trichloroethylene-in-Air Survey
IV. General Inspection (OSHA)
V. Miscellaneous

Should any questions arise, please contact the Safety and Loss Prevention Department.

NOISE SURVEY

OSHA Regulations call for protecting the employee against the effects of noise exposure. In view of this, a noise survey was made of the Puerto Rican facility on July 19, 1972.

CONCLUSIONS

Based on the measurements taken on July 19, 1972, it is the opinion of the writer that the Puerto Rican Plant meets OSHA Regulations and that the employees should not incur hearing disability.

DATA

Instrument Used: General Radio Sound Survey Meter - 1565A - Calibrated July 19, 1972 - Set on the A Scale- Slow response - All recordings at ear level.

Location	Decibel Reading A-Scale
A. Insertion Area - Resistor and Diodes	
(1) General Area between Units 1 - 9	84-89
(2) General Area between Units 1 - 7	84-89
(3) General Area between Units 1 - 5	90-91
(4) General Area between Units 1 - 10	82-89
(5) General Area, Walk Around	82-91
B. I.C. Insertion	
(6) General Area at Unit #3 (compressed air noise)	88
(7) General Area at Unit #2 (compressed air)	82-88

NOISE SURVEY (cont'd)

C. Hand Assembly

(8) General Area in Aisle Close to Wall	75-79
(9) General Area in Middle Aisle	77-79

D. Wave Soldering

(10) General Area between Units 2 and 3	75-79
(11) General Area between Units 1 and 2	70-75

E. Cable Area

(12) General Area close to First Aid Room	73-74
(13) General Area in Middle of Area	70-75

F. Eyelet Machines

(14) General Area between First Four Units	90-91
(15) General Area between Next Four Units	91
(16) General Area between Next to Last Four Units	85-88
(17) General Area between Last Four Units	82-87

THRESHOLD LIMIT VALUE

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

NOISE

The sound pressure levels for this Threshold Limit Value are measured by a sound level meter set on A-scale, slow response. The A-scale was chosen for this TLV because it discriminates against low frequency noise and most closely approximates the response of the human ear to sound. The resultant reading is expressed as "dBA" which means sound pressure level as read in decibels on the A-scale.

These Threshold Limit Values refer to sound pressure levels that represent conditions under which it is believed that nearly all workers

may be repeatedly exposed without adverse effect on their ability to hear and understand normal speech. The medical profession[1,2] has defined hearing impairment as an average hearing threshold level loss in excess of 15 dB[3] at 500, 1000, and 2000 HZ. The limits which are listed below have been established to prevent hearing loss in excess of this value. These values should be used as guides in the control of noise exposure and, due to individual susceptibility, should be regarded as fine lines between safe and dangerous levels.

The following table lists the permissible noise exposures for continuous noise:

DURATION PER DAY HOURS	SOUND LEVEL dBA
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
3/4	107
1/2	110
1/4	115-C (Ceiling Limit)

These values apply to total time of exposure per working day regardless of whether this is one continuous exposure or a number

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[1]Guides for the Evaluation of Hearing Impairment. Transaction of the American Academy of Opthalmology and Otolaryngology, pp. 167-168, March-April, 1959.

[2]Guides to the Evaluation of the Permanent Impairment: Ear, Nose, Throat and Related Structures; Journal of the American Medical Association, pp. 197-489, August, 1961.

[3](USASI Z24-1959)

of short-term exposures. These values do not apply to impact or impulsive type noise, such as drop hammers, etc.

The noise duration of 15 minutes at 115 dBA is a ceiling limit which is never to be exceeded.

The Threshold Limit Value for impact or impulsive noise is 140 dB-C as read on an impact meter fed by a sound level meter set on C-scale fast response.

It is always more desirable to control noise at its source than have a man wear ear protection.

If you need assistance in controlling noise, contact the Safety and Loss Prevention Department.

LEAD-IN-AIR SURVEY

Lead-in-Air samples were collected on July 19, 1972 in the general area, breathing zone level of the employees, near the three Wave Soldering Operations. The purpose was to determine the concentration of lead "fume" in air in order to evaluate the employee health hazard potential.

CONCLUSIONS

1. Six air samples were collected on July 14 and 15, 1972. The lead-in-air concentration at breathing zone levels ranged from not detectable to trace amounts. In view of this, cases of disabling lead intoxications should not occur among men who work for many years under such conditions.

2. The lateral exhaust ventilating system for the molten lead was, on the day of the survey, not operating effectively. Visable amounts of rosin from the flux and oil "smoke" prevailed, creating a nuisance condition from an odor standpoint. Also, in due time, the condensed "smoke" on horizontal surfaces, ledges, pipes, etc. will cause adverse housekeeping conditions. This condition will have to be corrected.

3. There are no recommendations for improved ventilation being submitted at this time. Improvements are under consideration and will be forwarded to you shortly.

RECOMMENDATIONS

1. Personal Hygiene

   Improved personal hygiene is needed in the area of wave soldering. There should be no smoking, no eating, and prior to putting anything in the mouth, the hands should be washed. Lead can be absorbed into the system by ingestion as well as by inhalation.

2. Wave Soldering

   The covers provided by Hollis for the Wave Soldering units should be used. It improves the rate of capture of smoke at the point of operation by making the "slots" more effective.

DISCUSSION

Lead may be takn into the body in three ways:

1. Inhalation

2. Ingestion

3. Skin Contact.

In this particular case, the prevention of lead by ingestion seems to be the most important area to control since no lead "fume" is generated. In order for lead "fume" to be present, the temperature of the molten lead must reach 700°F at the least. The temperature of the level in the three Wave Soldering Units did not exceed 550°F. Therefore, we urge that Recommendation #1 be enforced.

Lead is cumulative. Over a prolonged period of time, small amounts taken into the body remain there only to cause a toxic effect on the body. The toxic effect is a matter of dosage and the quantity of lead absorbed.

The flux and flux thinners produce obnoxious odors. They are composed of rosin and thinners primarily isopropyl alcohol. Other than causing nauseation, there appears to be no real toxic hazard.

Ventilation standards are being developed for Wave Soldering. We hope to publish them soon. In the meantime, try using the covers as recommended and watch the adjustment on the Hollis "Smoke Eater."

DATA

LEAD-IN-AIR

Date of Survey: July 19, 1972

Method of Collection: Filter Paper

Method of Analysis: Atomic Absorption (Analyzed at Liberty Mutual Insurance Company, Research Center, Hopkinton, Mass.)

Sample Number	Location	Mg Pb/cm of air*
1	Breathing Zone of employee at receiving end of Wave Soldering Unit #1 - Temperature 525°F approx.	Not Detectable
2	Same as #1	Trace
3	Breathing Zone of employee at receiving end of Wave Soldering Unit #3 - Temperature 525°F approx.	Not Detectable
4	Same as #3	Not Detectable
5	Breathing Zone of employee at receiving end of Wave Soldering Unit #2 - Temperature 520°F approx.	Not Detectable
6	Same as #5	Not Detectable

*Mg Pb/cm is milligrams of lead per cubic meter of air.

THRESHOLD LIMIT VALUE

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS - 1971

LEAD. . . . . 0.15 mg/cu.m.

TRICHLOROETHYLENE-IN-AIR SURVEY

This survey consisted of measuring the concentration of trichloroethylene-in-air to determine the degree of health hazard associated with degreasing operations.

CONCLUSIONS

1. From a health hazard standpoint, the exposure to trichloroethylene vapor-in-air was not significant even though in three instances the concentration of trichloroethylene exceeded the Threshold Limit Value, which is 100 parts of trichloroethylene per million parts of air. On a time weighted basis, these excess limits were still satisfactory.

2. An examination of the down draft exhaust ventilation system for the removal of trichloroethylene vapor from the basket and parts was not operating effectively. The exhaust system, left side especially, should be improved and in turn the trichloroethylene-in-air levels will improve. Verification of poor exhaust is shown in air samples #9 and #10.

3. The mechanical system for transporting racks in and out of the degreaser was operating within acceptable limits. The rate of rise of the hoist was only 11.5 feet per minute. Less than 12 feet per minute is generally recommended.

4. Other degreasing control measures, such as temperature circulating water, and vapor level control, appeared to be satisfactory.

5. There are no specific engineering recommendations regarding improved ventilation at this time. We have formed a group to study this problem and to determine universal standards for all DEC operations. Once determined, the standards will be forwarded to you.

RECOMMENDATIONS

1. Until such time as the exhaust ventilating system (left side) is improved, the exhaust system on the right side should be used as it is operating fairly satisfactorily.

DISCUSSION

Trichloroethylene is widely used as an industrial solvent, particularly in metal degreasing. It is primarily an anesthetic and the predominant effect obviously is one of central nervous system depression. The principle danger in industry from inhaling its vapors is visual disturbances and incoordination, which may lead to poor manual manipulation and therefore unsafe mechanical operations. Excessive exposure to high levels of trichloroethylene may have more severe effects.

On the day of the survey, the levels of trichloroethylene were, on a weighted basis, acceptable. However, from a nuisance standpoint and to be safe at all times, it is advisable to improve the exhaust system according to recommendations forthcoming. We will be striving to standardize the rate of exhaust at 100 to 125 cubic feet per minute per square foot of surface area at the face area of the down draft hood.

DATA

TRICHLOROETHYLENE-IN-AIR

Date of Survey: July 18, 1972

Method of Collection: MSA Universal Tester - Model 2 and Trichloroethylene Detector Tubes

Method of Analysis: Direct Reading

Sample Number	Location	PPM*
1	Degreaser on right - general area, breathing zone level immediately after degreasing rack full of sub-assemblies	153
2	Degreaser on right - general area, breathing zone level while degreaser at rest during break	72
3	Inside degreaser enclosure - degreaser undisturbed	116
4	Degreaser on right - general area, breathing zone level immediately after parts (8339) removed from degreaser are placed on Exhaust Grill	Less than 50
5	Same as Number 4 sample on degreasing sub-assembly 9728	50
6	Same as Number 4 only degreasing omnibus	50
7	Degreaser on left, general area, breathing zone level immediately after parts (11613) removed from degreaser are placed on exhaust grill	50

TRICHLOROETHYLENE-IN-AIR SURVEY (cont'd)

Sample Number	Location	PPM*
8	Degreaser on left, general area, breathing zone level as parts removed from degreaser and being lowered to exhaust grill	50
9	Degreaser on left, general area, breathing zone level, omnibus on exhaust grill	400-500
10	Degreaser on right, general area, breathing zone level immediately after omnibus degreaser as it rests on exhaust grill	100
11	Same as Number 10 only a few minutes later	50
12	General area, breathing zone, both degreasers at rest for 10 minutes	Less than 50

*PPM - Parts of vapor (trichloroethylene) per million parts of air.

THRESHOLD LIMIT VALUE

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

TRICHLOROETHYLENE. . . . . 100 PPM

Threshold Limit Value (TLV) - TLV refers to time weighted concentration for a 7 or 8 hour work day and 40 hour work week. They are guides and should not be used as fine line between safe and dangerous concentrations. There are exceptions (ceiling values) and when considered, they will be brought to the attention of interested persons.

Ventilation - Degreasing Operation

DATA

Down-Draft Hood - Right Side

Size of Down Draft Hood - 2' x 2' = 4 square feet

= 96 feet/minute

Air Velocity - Face Area of Hood

$Q = AV$

Where Q = Volume of air exhausted
A = Area of hood in square feet
V = Velocity (average) at face of hood

Therefore

$Q = (4)\ (96) = 384$ (approximately)

Down-Draft Hood - Left Side

Size of Down Draft Hood - 2' x 2' = 4 square feet

Air Velocity - Face Area of Hood = Less than 50' per minute

Note: Air volume through this hood too low to measure accurately.

This hood very ineffective.

GENERAL INSPECTION (OSHA)

This section of the report deals with the most obvious violations of OSHA standards which were found at the Puerto Rican facility during a "walk through" inspection. The section of the report is not intended to be absolute and other unsafe conditions could exist.

1. Handling Materials - Storage (1910.176)

   Standard -Storage of materials on racks shall not create a hazard. They shall be stacked, blocked, or interlocked and limited in height so that they are stable and secure against sliding or collapse.

   Violation -In many cases, the use of racks for storage did not meet this requirement. Many racks were unstable and could easily slide or collapse. Racks should be stabilized.

2. Personal Protective Equipment - Eye Protection (1910.132)

   Standard -Personal protective equipment for eyes, head and extremeties shall be provided, used, and maintained.

   The following areas require the use of eye protection:

   a. Hand Assembly
   b. Board Room

   Violation -Only eye protection meeting ANSI Standard Z871.1-1968 shall be worn. In some cases this was not being done. Also, so called "Visitors Glasses" and regular prescription glasses cannot be worn. They do not meet OSHA Standards.

   Note: Under separate cover you will receive a pocket polariscope. This will help you determine whether or not lenses are of the approved type from a tempered standpoint; but you will also need a micrometer to measure the thickness, as the lenses must be 3.0 mm. Most newly acquired glasses will, under a polariscope, show that they are tempered but will only measure 2.0 mm in thickness.

3. Fan Blade Guarding

Standard -Many questions have been raised about guarding fan blades. OSHA has issued the following:

a. All fans within seven feet of the floor, or the actual working level must be guarded.

b. Opening in the guards may not exceed 1/2 inch in width.

c. Nylon mesh may be used over guards not meeting (b).

d. Guards must be rigid enough to resist being pushed into the revolving blades during normal use.

While it is not part of the standard, we recommend guarding all fans above the seven foot height to protect maintenance and other people who occasionally service out of the way fans.

Violation -Several fans in your plant were not guarded, compliance with these standards is recommended.

4. Walking-Working Surfaces (1910.21)

Standard -Floors shall be kept free from holes, and loose materials.

Violation -In some areas of the plant (inspection) the floor was rough and had some holes in it. In general, this condition should be corrected.

5. Power Presses (1910.217) Touch-up and Punching

Standard -The requirements of this section are too extensive to discuss in this report. However, we are making arrangements to conduct a Machine Safeguarding Seminar. We recommend that you plan, once the date is set, to have 2 or 3 responsible people attend to learn the requirements to safeguarding, punch

presses, and other machinery, such as insertion, and Air Mite Units. In the meantime, temporary guarding will be recommended thru the help of Fritz Herbert, Tool Room, Maynard.

Note: This seminar will also include information regarding protection for foot operated controls.

Violation -Power presses and other pieces of machinery were not guarded. Guarding is needed.

6. Electrical (1910.314 Section 4C)

Standard -All portable, hand held, motor operated tools, and appliances of the following types should be grounded: drills, hedge clippers, lawn mowers, sanders, saws, etc.

Violation -Some tools in this category were not provided with a ground. They should be modified to meet the OSHA requirement. Office Equipment is exempt.

7. Dockboards (Bridge Plates (1910.30)

Standard -Dockboards should be secured in positions either by being anchored or by being provided with devices that will prevent their slipping.

Dockboards should be provided with hand holds to permit safe handling.

Positive protection should be provided to prevent railroad cars or trucks from being moved while dockboards or bridge plates are in position.

Dockboards should have a high friction rate.

Dockboards should be provided with sides turned up at right angles.

Violation -The dockboards in use did not meet these requirements.

8. Template Rack

This rack protruded about 1 foot into the aisle. Templates were sticking out into the aisle with sharp edges that could easily cut flesh. The rack should be moved in, and out of the aisle about a foot or more.

9. Air Drops

All air drops below a 7 feet level should be raised. Air drops should never be installed below the 7 feet level.

9. Air Generator

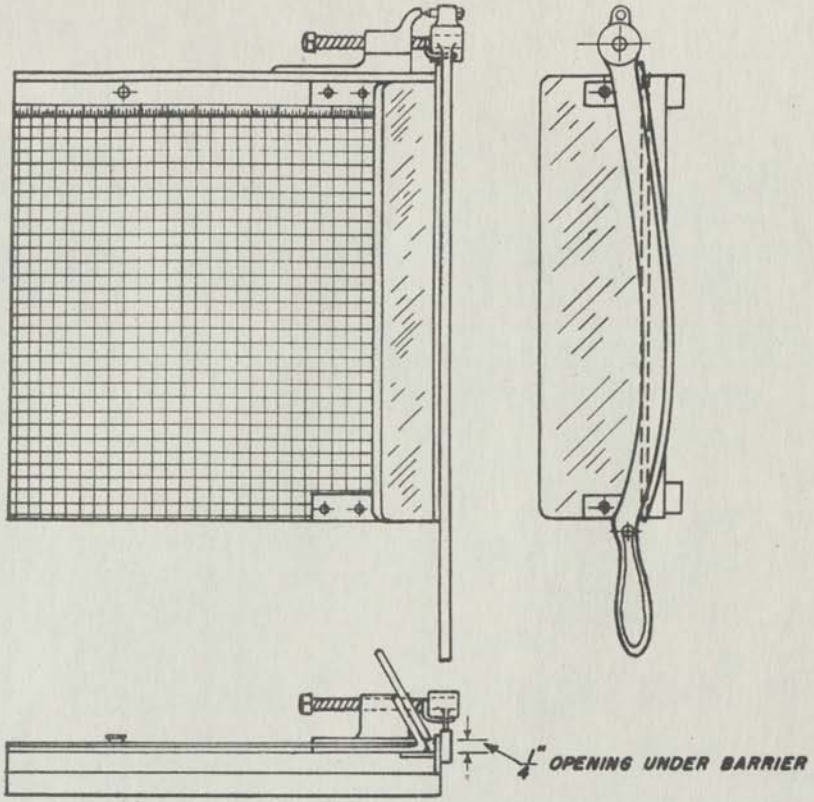
The belt driving mechanism should be provided with a guard.

11. During this visit we discussed the following:

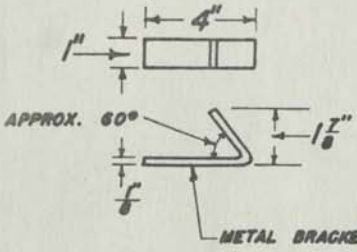
a. Safety Shoe Policy: The Personnel Department is studying the proposed policy. We expect to hear from them soon. Once policy is established, the wearing of Safety Shoes will be mandatory for employees working in the Plating Room, Maintenance Department, Shipping and Receiving, and material handlers.

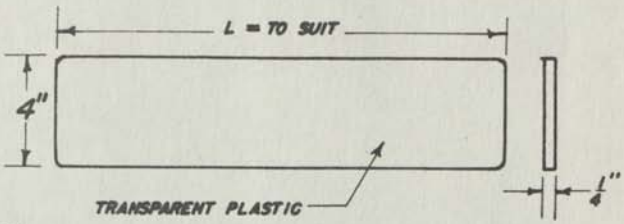
b. Aisle Markings and Definitions: The department is currently working on a DEC standard for aisles, etc. As soon as this is ready, we will send it to you. In the meantime, keep aisles as wide as you can within reason.

c. Barriers for Paper Cutters: Paper cutters should be guarded (silk screen). Enclosed is a drawing for a barrier for paper cutters.



GUARD DETAILS





BARRIER FOR PAPER CUTTER

MISCELLANEOUS

BOARD SHOP

The exhaust head provided for the Seal Brite operation depends on natural ventilation for the removal of the "vapors." It was obviously not working and this may be due to negative pressure in the room.

RECOMMENDATIONS

1. The Seal Brite hood should be provided with a mechanical exhaust system. The rate of exhaust should be capable of providing an inflow of air through the face of the hood of 125 feet per minute.

   Acetone was stored in an ordinary 5 gallon can. Since acetone has a very low flash point ($0^{\circ}F$) it is obvious that an approved safety can be used.

2. Flammable liquids should be stored in approved containers. Plant Engineering can supply you with approved containers.

   Since various types of chemicals are used, the use of personal protective equipment should be mandatory. The following is recommended:

3. Eye protection must be worn while working on the Gold Plating Line. Strong chemicals are used that could cause eye injury if in contact with the eyes.

4. An eye wash fountain should be installed in this area.

5. The fire extinguishers located behind the drums of caustic soda are poorly located. It is about impossible to reach. Relocate to a more desirable spot.

SILK SCREEN AND SCREEN PREPARATION

RECOMMENDATIONS

1. Shelves should be provided for the storage of chemicals. Presently storage is haphazard.

2. Since xylenes as well as other strong chemicals are used, personal hygiene should be improved to minimize the dermititis potential. Your Medical Department should be consulted for assistance.

CHLORINE HANDLING

A meeting was held on July 14 and 15, 1972, for the purpose of re-emphasizing the importance of chlorine safety and persons directly involved in chlorine handling attended. A film, "Chlorine Safe Handling," was shown and discussed. Also, recommended items in a memo to Bob Somboline from Dick Reynolds, 1/31/72 was discussed and all items completed (Memo in L.P. file - Puerto Rico).

GENERAL REMARKS

At a later date, we hope to visit Puerto Rico and work in the following areas:

1. To organize and establish a Plant Emergency Organization (P.E.O.).

   a. P.E.O. Organization
   b. Recruiting Members
   c. Equipment Requirements
   d. Training Program

2. Development and implementation of weekly plant inspection of fire protection valves and fire pump.

3. Establish building evacuation plan, alarm tests, and periodic evacuation drills.

MISCELLANEOUS (cont'd)

4. Establish procedure for required inspection and hydrostatic testing of portable fire extinguishers and standpipe hose.

5. Investigate and analyze computer and plant operations to determine any areas of high loss potential requiring special protection, isolation, duplication, etc.

6. Inspect plant loss prevention equipment and systems with special attention to emergency lighting and exits, and flammable liquid storage and handling.

DISCUSSION

It is very necessary to have a P.E.O. group due to the lack of an adequate Fire Department in San German. With due respect to the Fire Department and its personnel, they cannot, in my opinion, provide an adequate fire fighting group nor do they have appropriate equipment to cope with such a large complex of ours. Since the first few minutes of any fire are vital to quick control, we had better be ready to protect our personnel and property initially and even during a fire. In fact, once we have a well trained P.E.O. group, the San German Fire Department would be supplementing us rather than we supplementing them.

I had the pleasure of meeting Luis Merales, Fire Chief, San German, and he agreed to assist us in training our people.

We will be visiting Puerto Rico shortly to organize and implement a P.E.O.

RR:tam
cc: Ken Olsen
Howard Austen
Fred Bowers, Puerto Rico
Dick Esten, Puerto Rico
Jamie Ferra, Puerto Rico
Bill Plant, Puerto Rico
Jack Grieves
Bill Hanson
Al Hanson
Don Gates
Pete Kaufmann
Harold Trenouth

✓Puerto Rico
Maynard

Memo

JUL 14 1972

INTEROFFICE MEMORANDUM

XR Waste Treatment

TO: Bill Krasno
Jack Harrigan

DATE: July 11, 1972

FROM: George Wood

CC: G. Lordi
A. Hanson
R. Cajolet
J. LaBate
W. Hanson

DEPT: Process Engineering

SUBJ: MINUTES OF MEETING ON WASTE TREATMENT - MAYNARD P.T.H. AND PUERTO RICO

Next Meeting: Tuesday, August 15, 1972
Conference Room C - Building 1-4
Time - 9:00

Bill discussed the timing relative to our application to the E.P.A. for a grant, the start up of the new Maynard treatment plant and inquiries from the state. As it now stands Bill will meet with C.D.M. and Hans Bonne to discuss ways to make all schedules compatible.

The form for information on air polution was also discussed:

Bill will confer with Ed Schwartz.
Jack will feed board shop information to Bill by Friday 7/14.
George will handle the module assembly and machine shop areas thru Ron and get first pass information to Bill by Friday.

Hiram Quinones now has all the information and direction he needs to proceed on gathering sampling data in Puerto Rico. We should be able to discuss this on August 15th.

Maynard memos

digital INTEROFFICE MEMORANDUM

✓ Puerto Rico XR Waste Treatment

TO: Al Hanson, J. Harrigan, R. Mooney, G. Lordi, G. Wood — MEETING MEMBERS

DATE: 6/6/72 memos attached

FROM: G. Wood

DEPT: Process Engineering

CC: R. Cajolet, W. Hanson J. LaBate

SUBJ:

MINUTES OF MEETING ON WASTE TREATMENT - MAYNARD P.T.H. AND PUERTO RICO

NEXT MEETING: Monday - July 10, 1972
Conference Room - 1-4
Time - 9:00 A.M.

The above group met to discuss waste treatment in Maynard and Puerto Rico with the hope of taking positive action toward a solution to our current problems. The combined trip report (George Wood - May 8, 1972 - attached) was discussed and we decided to proceed as follows:

1. Al Hanson will solve the Maynard Building 7 waste treatment problem, with this group acting as non-voting advisors to the consultant.

2. Bill Krasno (a new hire coming into Al Hanson's group) will take over the responsibility for Building 7-1 waste treatment.

3. Jack Harrigan/John LaBate will hold any further development of the current C.D.M. proposal and refer all inquiries to Al and Bill.

4. The above group (meeting members with J. LaBate an other or alternate member) will meet once a month to review progress.

Puerto Rico -

1. George Wood will discuss Ramon Guzman's (environmentalist in Puerto Rico) reports with Al Rimer of C.D.M. and seek his recommendations.

2. Bill Krasno will become involved as soon as he can get acclimated.

CC file Bill Krasno

INTEROFFICE MEMORANDUM

TO: RON CAJOLET
CC: J. Harrigan
J. LaBate
G. Lordi
D. Knoll
A. Hanson
R. Mooney
J. St. Amour

DATE: MAY 8TH, 1972

FROM: GEORGE WOOD, 1-4

DEPT: PROCESS ENGINEERING

SUBJ: TRIP REPORT

In early April, Gerry Lordi, Jack Harrigan and I visited Abcor Inc., Cambridge, Massachusetts to discuss two things:

1. Their experience in reverse osmosis as a tool for waste treatment (they have recently received a government grant for research in this area).

2. Their work as waste treatment consultants to the chemical (plating) industry.

During that visit we were impressed to the point that we wanted more information namely: information as to the size of the company, the facilities available and their capacity limitations - and we wanted to visit one of their installations to see first hand how they performed.

Subsequent to that visit, Gerry Lordi and I visited an Abcor installation in Fall River. Mr. William Dailey, Chief Process Engineer of DeSoto Inc., and Mr. John Bowen of Abcor took us on a tour of the plating facility and the associated treatment plant. In short summary:

The installation was neat
The installation was functional
The installation was understood by Mr. Dailey
The installation was apparently in good working order.

On the same day Gerry and I visited Baker Brothers Manufacturing facilities in Canton, Mass. and talked with:

Neal Baker - Sales Manager
Larry Greenberg - Technical Director
Peter Molleux - Chemical Engineer (formerly with the Mass. Division of Water Pollution Control)

Baker Brothers not only makes and sells equipment to the plating industry but they also specify, design, build and install waste treatment facilities. They build both systems to treat what comes out of the plant as

"package" units to treat waste in-the-plant. We looked at their package units and they have built them to be functional:

Solutions are easy to add (no dilution)
Components are standardized
The structure is modular

Neither one of these companies is in a position to supply the "total approach" effort to our multi-plant operations that we now get from C.D.M. and yet both are local concerns with manufacturing facilities of their own so they do provide a single source for responsibility and thereby overcome the kind of problem that we had with both C.D.M. and Lancy Labs namely: late deliveries, incorrect wiring hook-ups, unsatisfactory equipment, etc.

Based on the above, and with the assumption that we would have to talk further with either these or any other waste treatment consultant, I submit, by way of this memo, the following recommendations:

1. That Al Hanson place no more waste treatment contracts with C.D.M. until C.D.M. either:

   a. Demonstrates a further ability or experience background to treat plating wastes.

   b. Hire the services of a company similar to either Abcor or Baker Brothers and provide us with the experience and background needed.

2. Jack Harrigan and John Labate agree to no modification or improvement to the present waste treatment facility in Building 7-1 without serious consideration to the advantages of "package" type systems.

GW/acp

Geo.

Puerto Rico

memos
XR Waste Treatment

digital INTEROFFICE MEMORANDUM

TO: F. Bowers
CC: Al Rimer (CDM)
Al Hanson

DATE: April 26, 1972

FROM: George H. Wood

DEPT: Process Engineering

SUBJ: SAMPLE PUMP AT WASTE TREATMENT

Al Rimer recently wrote to Hiram on 4/19/72 and forgot to copy you, so I have enclosed your copy herein. I have also enclosed a copy of his cover letter to me. Please note his reluctance to express confidence. Would you please look into this and tell me whether or not the matter needs my further attention?

In essence the problem is this:

1. The effluent sample pump ruins impellors because it runs dry some of the time.
2. It should be O.K. if it was tied into the wet well pumps.
3. Al Rimer sends herewith the wiring diagram to hook it up, but is somewhat in the dark because he doesn't have the marked-up copies of the final installation.

By letter copy of this memo, I am asking Al Hanson to have his people secure the marked up installation drawings and copy them for distribution to those who need them.

Please contact me if you have any problems.

Also, by copy of this memo I am asking Al Hanson to look into Al Rimer's comments on charge numbers (crossed out on your copy). I don't have the ability to assess Ramon Guzman's inputs and CDM doesn't have an account to handle it.

Al, please let me know what you work out for handling this problem.

Thanks,

George

GW:esp

cc
file
P Mackey → pls handle these problems.
And C. — And H.
Geo B
Harold T.

Puerto Rico Ifo i Al Hanson (+dept)

digital INTEROFFICE MEMORANDUM

memo

TO: Bob Samboline
Hiram Quinones

DATE: 4/3/72

CC: Fred Bowers
Lillian Santiago
Al Rimer (CDM)
Romon Guzman

FROM: George Wood
X R Waste Treatment

DEPT: Process Engineering

SUBJ: EFFLUENT SAMPLING PLAN - CIRCUIT BOARD SHOP - PUERTO RICO

Mr. Ramon Guzman is currently under contract to provide consulting services to the Puerto Rican plant. One of his current tasks is to perform sample measurement of our effluent so as to establish the need, if any, to modify or adjust the waste treatment plant. In his current progress reports (I refer to reports dated 2/25/72, 3/10/72 and 3/23/72) there are some disturbing variations in test results, but on careful examination there also exists some wide variations in conditions at the plant. With the full realization the plant will not always run under ideal conditions, I am suggesting that we test under ideal conditions until we establish a working base. Once having that base we can decide how to revise the system to allow for variations in the process.

On that basis I would like you to continue sampling on the following basis:

1. Arrange in advance dates and times for sampling.

2. Meet Mr. Guzman and have someone accompany him on his routine. (Hiram, Fred Bowers, Bob Samboline are all well qualified)

3. Sample only when the entire chemical process is running. Refer to the process water summary table in the Operating Instructions Manual. (Note: Attached is an excerpt from Ramon Guzman's report of 2/25/72. Please notice that the rinses in the gold plating tank had no flow rate and were apparently inoperative. All rinses should be on. Any inability to run the process as designed should be clearly noted.

   In addition, it would help if we could run product through all the processes while taking the samples. Later on we can determine the effect of shutting down the tin line or the etcher, etc.

4. Mr. Guzman will segregate the data taken under the above conditions, and report his findings and recommendations for review and analysis.

Then we can start a program to determine how we affect the effluent characteristics when things go wrong or we shut off rinses, etc.

Please reply acknowledging receipt of and concurrence with the above.

George

Geo.

RAMON M. GUZMAN & ASSOCIATES
Consulting Sanitary Engineers
FIRST FEDERAL BLDG., OFFICE 404, SANTURCE, P.R.

TABLE I
ESTIMATES OF WATER USAGE

Source	GPD	Gals/week	Observations
Eye Wash	Nil		
Eye Wash	Nil		
Eye Wash	Nil		
Scrubber	526		
Photo Prep Sink	65		
Screen Prep Sink	750		
Screen Wash			
Rinse	Nil		
NaOH Tank		175	
Board Strippers			
Rinse		10	Water is changed once a week
NaOH Tank		105	
Cupric Chloride Tank		---	Flow is collected and sent to U.S.
Standing Rinse		Nil	No waste from this source
1st Running Rinse	10		
NaOH Tank		120	
2nd Run Rinse A.P.	10		
Gold Plate			
Electroclean		30	Water changed once a week
A.P. Rinse		60	Water changed twice a week
10% Acid Rinse		30	Water changed once a week
5% Acid Rinse		30	Water changed once a week
Rinse(Gold)		2	Water changed once every 2 month
Reclaim Rinse			
a)		5	Water changed once a week
b)		1	Water changed once a week
Immersion Tin			
Neutra Clean 7		1	Water changed once every 6 month
A.P. Rinse		*	Not in use when measures were made
Tin Rinse		60	Water changed twice a week
	1361	529	

* Will make measurements on next visit

Total Gals/wk. : 7,334

1,467/operations day

digital INTEROFFICE MEMORANDUM

Puerto Rico

TO: Bill Hanson
Joe St. Amour

DATE: 1 March 1972

memo
XR Water
XR Proposal

cc: Dave Knoll
Al Hanson

FROM: George Wood

DEPT:

cc File
Geo Babe.

SUBJ: FEASIBILITY OF PTH MANUFACTURING IN SAN GERMAN, PUERTO RICO

Conclusion

It is feasible to manufacture plated-through-hole circuit boards in San German, Puerto Rico in high volume and at high yields. However, to do so requires the acceptance of the following basic guidelines:

1. Plan space and capital for two to three times the normal inventory of spare parts and some process materials.

2. Automate wherever possible.

3. Hire two or three key people eighteen months prior to startup and train in the Maynard Board Shop for one full year. Another alternative would be to transfer at least two technically qualified Maynard employees to Puerto Rico with a long-term commitment.

4. Allow a full year from the time we accept a proposal until production startup.

Discussion

To reach the above conclusions, the following factors were studied in detail:

Water

Incoming flow rates of 450 gallons per minute (ample for PTH and print and etch manufacture) are available on the present plant site and can be brought to the plant site for $40,000. (Please see CDM Report, dated 25 January 1972.)

Waste Treatment

Process waste would be treated by expanding the present waste treatment plant. This could be done at a cost between $70,000 and $140,000. (Please see Tom Mac Donald's Memo, dated 18 February 1972.)

Power

There is an ample supply of power. Currently available at the plant is 2600 kva.

An additional 1000 kva is attainable in fifteen weeks for about $17,000. An additional 3500 kva is possible by duplicating the present system.

Unless the present low voltage problem is resolved, it might be necessary to require voltage stabilization.

Space

Fifteen to twenty thousand square feet would be required inside the building. A tunnel exists under the new building to allow for waste discharge.

Technical Talent

Electroplaters in Puerto Rico are virtually non-existent. Because this process requires a certain background and attention to detail, this lack of talent availability can best be overcome by:

1. Training in Maynard
2. Automation wherever possible
3. Sending talent skills to Puerto Rico

Materials

Communications, delivery routes, strikes, and various other handicaps make it very difficult to depend heavily on equipment and material suppliers for stock. For these reasons, three months' inventory is in no way unrealistic.

Miscellaneous

No effort was made to tie down exact costs and capacities, but it should be understood that the above factors are based on a facility with output capabilities in the range of one hundred thirty-five panels per hour.

Start-up timing will be affected in large part by the following:

1. Long lead time on automatic equipment
2. Long lead time on waste treatment equipment and controls
3. On-site checkout of the process

   (It is impractical to bring all automatic equipment to Maynard for checkout.)

/gg

Puerto Rico

memos
XR Waste Treatment

2/24/72

TWX

TO: BOB SAMBOLINE
CC: HIRAM QUINONES
FRED BOWERS
JOHN LABATE
L. BEAUPRE
RON CAJOLET
JOE ST. AMOUR
W. HANSON
A. HANSON
TOM MACDONALD
FROM: GEORGE WOOD

SUBJ: UPCOMING INSPECTION OF THE WASTE TREATMENT AREA BY IRISH AUTHORITIES

ON OR ABOUT MARCH 7TH AL HANSON, TOM MACDONALD (PLANT ENGINEERING) MYSELF AND OTHERS WILL VISIT THE PLANT ALONG WITH ONE OR TWO PEOPLE FROM IRELAND. THESE MEN ARE CONCERNED THAT COMPANIES SAY A LOT ABOUT WASTE TREATMENT, BUT SELDON DO WHAT THEY SAY. IT IS OUR INTENTION THAT THEY WILL COME AWAY FROM SAN GERMAN WITH CONFIDENCE IN DIGITAL.

IT IS NOT MY INTENTION TO GIVE ANY FALSE IMPRESSIONS; THERE IS NO INSTALLATION WITHOUT PROBLEMS. I WOULD LIKE TO DEMONSTRATE THAT WE IDENTIFY AND SOLVE OUR PROBLEMS. IN THAT REGARD I WOULD LIKE TO BE PREPARED TO DEMONSTRATE AS REQ'D.

1. DAILY LOGS OF THE OPERATION

2. MEMOS, TWX'S, ETC. INDICATING EFFORTS TO CORRECT OR UPGRADE THE REPORTING ON THE LOGS.

3. PURCHASE ORDERS OR OTHER FOR SERVICE CALLS TO EQUIPMENT OR CONTROL MANUFACTURERS FOR ADJUSTMENT, REPAIR OR CALIBRATION SERVICE.

4. ACCESS TO AND UNDERSTANDING OF OPERATIONS MANUALS AND THE MAINTENANCE AND ADJUSTMENT PROCEDURES OF THE VARIOUS CATALOGS.

5. A RUN THRU OF THE DAILY CHECKS AND PH ANALYSIS FOR THEIR OBSERVATION.

CONTINUED.....

OF COURSE, IT WOULD HELP TO HAVE THE AREA CLEAR (I.E., NOT USED FOR DRUM STORAGE). I WILL OF COURSE BE THERE, BUT IT WOULD BE VERY IMPRESSIVE IF ALL THEIR QUESTIONS COULD BE ANSWERED BY HIRAM, LUIS LILLIAN FRED OR YOURSELF.

(PLEASE ACKNOWLEDGE PERSONAL RECEIPT OF THIS TWX. I WILL GET BACK TO YOU WITH SPECIFIC DATES AS I KNOW THEM.)

GW/acp

digital INTEROFFICE MEMORANDUM

memo W/attachment

Puerto Rico

XR Water

TO: Al Hanson

DATE: February 14, 1972

FROM: George Wood

DEPT: Process Engineering

W/attachment

SUBJ: PROPOSED WATER SYSTEM - SAN GERMAN, PUERTO RICO

Ref: Your Memo, February 4, 1972

In essence I would agree with your conclusion. We should start drilling a well on DEC property, but I don't think it's necessary to spend $40,000. If my memory serves me right, we can spend $15,000 drilling and test pumping the wells and then separately commit the rest of it to pump the water and pipe it to the plant. Approaching it in steps we can only spend the $40,000 (my notes say $30,000) as required.

I spoke briefly with Dave Knoll and he said that this project will have to be handled by Lon Beaupre. It's Lon's job to make things happen in Puerto Rico as things need to be made happen. I think that any water we get from these wells will serve as a backup to our present "marginal" water supply from Aquaductos and at the same time serve to extend our capabilities for putting in PTH or other wet processes in Puerto Rico. We should start digging the two additional wells with the intent that we spend between $30,000 and $40,000. I am assuming that you will go ahead with this project (with approval from Lon Beaupre) and proceed to dig two more wells, test them, and connect to the plant. If there are any misunderstandings please let me know.

GW:esp

Geo.

DEC 5-(641)-1043D-R271

DIGITAL EQUIPMENT CORPORATION — INTEROFFICE MEMORANDUM

TO: George Wood
cc: Ray Carlson
Pete Mackey
George Beebe
Central Files

DATE: February 4, 1972

FROM: Al Hanson

DEPT: Plant Engineering

SUBJ: PROPOSED WATER SYSTEM - SAN GERMAN, PUERTO RICO

Ref: CDM report, Peter Ware, January, 1972.

The following analysis assumes we can get all the water necessary on DEC property, San German, Puerto Rico (450 GPM).

	On DEC Property	Guanajibo River - Wells
Construction Cost		
1. Cost of wells (3)	40 K	100 K
2. D.I. equipment	226	226
3. 750,000 gal. tank pumps & house	120	120
Total	386	446
Operating Cost - Annual		
Cost of water	0	48
Maint. of equipment	30	0
D.I. - Maint. & Chemicals	21	21
Cost/yr.	51 K	69 K

NOTE: George Wood, I went over these figures carefully with Peter Ware. Let's recommend spending (40K) to drill wells on DEC property and start pumping ----- The gamble represents about 10% of the total cost to do it the CDM way (446 K) ----- We will have a history of the wells (18 mos.) if you follow your proposed schedule.

mm

DEC 6 (641)-1043D-R271

digital INTEROFFICE MEMORANDUM

Puerto Rico

mang file

TO: BILL PLANTE

DATE: DECEMBER 27, 1971

XR Safety

CC: (SEE DISTRIBUTION LIST)
Laurie Best 4-3

FROM: GEORGE WOOD, 1-4

DEPT: MFG. ENGINEERING

SUBJ: CHLORINE SAFETY PRECAUTIONS

I recently met with Laurie Best to discuss our program for safely handling chlorine. His concerns are as follows:

1. Is there a good alternative to cupric chloride for etching?

2. Do the people using it know the hazards?

3. Do we have a training program which calls out periodic retraining so as to serve as a refresher course as well as an indoctrination for new people?

4. Do we have adequate safety devices and handling equipment and do the people know how to use them and care for them?

5. Are hazardous areas clearly marked, isolated and well protected against mishap?

6. Do we have well documented and understood procedures for emergency conditions?

7. Are the operators req'd to take a mask with them when they enter the concrete pit on the pad?

8. Is the local Fire Department fully aware of the hazards and their locations?

9. Have we exhausted all reasonable approaches to using 150 pound cylinders?

I answered the above questions as best I could and promised Laurie that I would give him a status report on February 1st.

Note: There is no new cause for alarm. This is just another timely concern for preventive safety. The questions are better asked now than after it's too late.

Toward a responsible status report on February 1st I have committed us (you and I) as follows:

Item 1 - No etchants available on the island and no disposal means. Cupric chloride, therefore, is still the way to go providing we take adequate safety measures. (No change by February 1st.)

Item 2 - The people do know the hazards and a new training course is being scheduled (schedule by me on February 1st).

Item 3 - No present retraining schedule. I suggest every six months, do you agree?

Item 4 - Safety devices and handling equipment presently inadequate for the one ton containers. New equipment on order as follows:

Item	P.O. Placed	Expected Del.
2nd Scott Air Pack	By Puerto Rico	?
Emergency Capping Kit	12/13/71	2/28/72
4 Pocket Respirators and 4 cartridge Refills	12/21/71	1/21/72
8 C-256 Chlorine Trunnions	12/21/71	1/14/72
Hand Truck W/Barrel Saddle	12/31/71	2/11/72

Item 5 - The cylinder area on the pad is not marked. Will you place a sign near the tank reading ‖ Danger Chlorine ‖ ?

Will you also comment on the feasability of installing a one block high cement block wall around the area? It should allow access, but at the same time protect against accidental damage.

Item 6 - We have four booklets on Chlorine Handling, Safety Precautions and Emergency Procedures. Will you verify that two or more people have read at least one of them and understand its contents?

Item 7 - This is one I never thought of. The gas being heavy would fill the pit first. Will you arrange to post the area and insist that any one going into the pit take a mask in with him?

Item 8 - I suggest that you and Lon arrange to have the local Fire Chief in to see the layout, and observe what hazards are where. If you point out the chlorine specifically it might cause undue alarm.

Note: This is no more dangerous than the local water treatment plant, but he is used to that and we store it in greater quantity.

Item 9 - Is there any possible way of getting back to 150 pound cylinders? Can you order 6 months in advance, keep 20 extra cylinders on hand, and use P.P.G. containers only if your supply of 150 pound cylinders gets below a certain set minimum?

GW/acp

Distribution List

Lon Beaupre
Laurie Best
Fred Bowers
Bill Hanson
Bob Hopley
Bill Plante
Hiram Quinones
Dick Reynolds
Bob Samboline
Luis Velez

cc: Al Hanson
Don Gates
Pete Mackey

12/30/71
RB

Puerto Rico

memo
file
XR Land

Bob Dill

December 20, 1971

cc: Al Hanson

D. Knoll

Central Planning

PUERTO RICO

Attached is the background info on a possible use of our money in Puerto Rico that I mentioned to you. Call me when you've read it, and we can discuss. I'm fairly sure there's nothing here for us, but it seemed like an unusual scheme worth a glance at least.

jkl
Att.

Al home 832-2261
office 832-5535

BACKGROUND TO SPS's PUERTO RICAN LAND AQUISITION

In early 1968, following 18 months of "off-and-on" searching for a suitable plant site in Puerto Rico, SPS came in contact with a family owning 120 acres in Añasco, a town of about 8,000, seven miles north of Mayaguez.

Of the total land holding, 80 acres were flat and ideally suited for industrial use; 40 acres were situated on rolling-to-steep terrain, but with good residential use possibilities. Because isolated zoning changes are difficult in Puerto Rico, the 80 acre piece (zoned agricultural) had the added attraction of being contiguous to an industrial tract owned by the Commonwealth government.

In Puerto Rico, industrial parks as known in the States do not exist. The closest thing to them are Fomento Parks, small industrial developments, usually of 2 acre sites segregated in clusters aggregating 6-40 acres. On these industrial plots Fomento, the P.R. government's industrial promotion arm, builds for lease concrete factory modules of 11,500 square feet -- usually in multiples of 1 or 2, but sometimes more. The buildings are usually of the same design, strictly utilitarian with a minimum of frills (no air conditioning, limited toilet facilities, little parking if any,

limited ceiling heights, 4" floors, etc.) however, perfectly adequate for most light manufacturing uses. By concentrating on this type construction, Fomento has been able to attract large numbers of new--for the most part, labor-intensive--industries, and at the same time keep their building costs to a minimum. It has been a very sensible policy.

This policy, however, has not helped the manufacturer requiring a specially constructed plant and/or special infra--structure needs. His alternative has been to find land himself, negotiate a purchase option, and launch into the many problems associated with zoning variances, permits, hearings, and the extension of utility services (assuming the utility agencies have sufficient capacities to serve his expected needs in that particular area.) This is not easily done and many companies, who ordinarly would locate in P.R., finding themselves confronted with these challenges, have backed away.

The P.R. government is very much aware of this problem, however, with limited capital investment dollars at its disposal, it has simply been unable to launch upon construction projects for special purpose plants.

In any event, SPS decided to go ahead on its own, and while a number of factors influenced the decision, one of the main ones was the attractiveness of this particular tract of land. For example:

1. Land expanse - there were 80 acres of flat land with good drainage. In Puerto Rico, this is a very large plot of industrial land, and such land is almost non-existent.

2. Access - the main circumferential island highway (scheduled to be totally 4-lane divided by 1975) was only 1 mile away via State Road 402, which actually ran thru the property. In travel time, Mayaguez was 15 minutes away; the airport, 10 minutes; Ramey Air Force Base, 20 minutes; San Juan, 3 hours by road, 30 minutes by air.

3. Water - city water ran to the edge of the property and, though inadequate in volume for large scale industrial purposes, sufficient for our initially planned SPS operations. Long range, the Añasco river less than a mile away, constituted the largest, most dependable fresh water supply source on the island.

4. Transportation - all container trailer companies served the area. If the ocean carriers chose to handle their "to and from Puerto Rico" freight thru the SAn Juan port rather than thru Mayaguez, they bear the 100 mile over-the-highway shipping costs to San Juan. (This meant the Añasco site enjoyed the same freight rates as a plant located in San Juan.) Air travel was excellent, 30 flights daily to San Juan and the airport only minutes away. The proximity of the Mayaguez port also meant that non-container shipments - such as steel or other commodities from Europe or Japan - could be off loaded there at a considerable trucking saving rather than in San Juan.

5. Power - one of the electric power authority's main high voltage transmission lines ran within 800 yards of the property with no intervening easement problems. (In Puerto Rico the customer, in addition to paying $20,000/mile extension costs, also pays for any easements, plus litigation costs.)

6. Tax Exemption Zone - the land was situated in a 15 year tax exemption zone, one of the longest offered in Puerto Rico (only remote, montainous areas have longer exemptions of 17 years.)

7. Federal aid eligibility - being located in a zone of heavy unemployment, the area was eligible for 80% U.S. Government grants for the construction of roads, water lines, sewers, etc. (This is part of the Federal OEO program to encourage industries to locate in such areas.)

8. Labor availability - the Puerto Rican Department of Labor's Mayaguez regional office had then - and has now - the names of 15,000 unemployed males looking for work - over 2,000 of them with a high school education and an English language capability. Another favorable consideration was that the western part of the island was much less inclined to unionism than other parts of the island.

9. Proximity of the University of Puerto Rico's Mayaguez Campus - a very significant advantage to industry locating in the western part of the island is UPR's School of Engineering and Agricultural Sciences seven miles away in Mayaguez. This school, with an enrollment of 9,000, many faculty members from universities in the States, and good research facilities, provides good technical back-up to industry and is an excellent source for bi-lingual engineering talent needed by all companies.

All in all, these were attractive "pluses".

Following a number of meetings with the Planning Board, Water, Power, and Highway Authorities, relative to their supporting efforts, SPS purchased the land and began the simultaneous tasks of

(1) building and equipping a modern 130,000 sq. ft. metal fabricating plant and training 300 production worker candidates--almost none of whom had prior industrial experience of any kind--and

(2) tackling the longer--ranged job of developing, together with Fomento and other Puerto Rican governmental agencies, plans and programs that would enable the company to develop its property for industrial use.

Task No. 1 understandably received the most attention, but there were accomplishments, too, in the area of Task No. 2

SPS's PROMOTIONAL AND COORDINATING EFFORTS

Over a period of almost 4 years, SPS has worked closely with all P.R. government agencies in promoting development concepts that would benefit the Commonwealth's industrialization program. Some of our accomplishments to date are:

(1) the development and acceptance of a 20-year community development plan for the town of Añasco. (See Figure A)

This plan, the first of its kind for any community in Puerto Rico, provides for the orderly growth of the town from 8,000 population to more than 30,000 over a 20-year period. Circumferential highways, school and recreational park sites, industrial park zones, a new civic center area, intermediate arterial roads, water and sewer trunk line alignments, have been provided for.

The significance of this accomplishment is that all P.R. governmental agencies have concurred with the plan and the committment of each now is to the carrying out of a development plan that can only enhance the values of any industrial complex established there. Future zonings, highway routings, utilities extensions are all included in the package.

(2) developing, with Fomento, the concept of establishing a series of special--purpose industrial park "enclaves" around the island--of which Añasco is planned to be the first.

Once the Añasco community development plan was fixed, the next step was to assure the industrial zone being adequately serviced with water, power, sewage, and industrial waste facilities. (SPS's own manufacturing experience has been that there has been barely enough water for its own plant needs-certainly none additional for others--and that no sewage or industrial waste services were available whatsoever. These latter facilities the company had to provide themselves.)

While water, power, and sewage problems have long been a deterrent in Puerto Rico to a more rapid growth of the more sophisticated, capital--intensive industries, a new complication has been introduced in the form of environmental pollution control requirements. The same laws and standards that apply in the U.S. apply to Puerto Rico. This means that, while existing pollution--generating industries will be given certain periods of time to put their "houses in order", new industries will not be allowed to start operations until all their manufacturing processes conform to the new laws.

The choices open for new industries coming to Puerto Rico, therefore, are either to provide their own government--approved waste disposal

- at added capital investment costs - or to tie into some type of centralized facility capable of handling compatible wastes from a number of plants.

With its own experiences fresh in mind and realizing the serious effect the new pollution control laws were going to have on the industrialization program in Puerto Rico, SPS presented a plan to top government officials suggesting the establishment of 5 or 6 special purpose industrial centers around the island - each geared to the needs of a specific industry grouping i.e., food processing, pharmaceuticals, metal fabricating, petro-chemicals, etc. These "enclave" areas -perhaps 100-200 acres in size - would be furnished with adequate water, sewage, industrial waste disposal, transportation, and communications capacities to handle the needs of special, capital-intensive, type plants. These plants, it was pointed out, could in addition to handling their own production requirements, in all probability also provide "core" services and materials for scores of light manufacturing industries already on the island. Such regional planning would result in major economies for the utilities companies, vastly improved construction time schedules, reduced capital expenditures for new industry coming to Puerto Rico, and enable the Commonwealth to accept more special-purpose companies into the industrial community than they otherwise could have accomodated.

Fomento was especially helpful in pushing this enclave concept and without their support the proposal would not have gotten far.

As a direct result of the SPS--Fomento effort, both the Governor's Office and the Planning Board have endorsed the plan and it is now being implemented by the Planning Board in their regional planning. In the meantime, the SPS industrial complex will constitute the first such area--oriented toward, but not limited to, metal fabricating type industries.

(3) gaining agreement with governmental authorities to fund and construct important utility needs for the Añasco special purpose industrial park.

Highways: The U.S. Department of Commerce (EDA) has agreed to provide 80% funding for new access roads from U.S. Route 2 to the park site. The P.R. Highway Authority will furnish 20%.

P.R. Route 405 (see Figure B) traversing thru SPS's proposed residential lands, has been designed and funded for $300,000 by the P.R. Highway Authority. Construction will start in 1972.

Water: A new 16" water trunk line with supporting pumping stations is now under construction between the main Mayaguez filtration plant and the Añasco park site. Upon completion in May 1972, it will be capable of delivering 6,000,000 gallons per day.

Water for Fire Protection: For standby fire reserve, a new 300,000 gallon reservoir has been constructed on high ground above the Añasco site. Additionally, the U.S. Soil Conservation Service has completed field borings, percolation tests, and construction drawings for a 3 million gallon storage pond in a defile behind SPS's manufacturing plant. Estimated construction cost, $10,000.

Sewage: The new U.S. Environmental Protection Agency-sponsored western P.R. sewage treatment plant (Mayaguez) together with its collection system and 1.5 mile long ocean outfall effluent line - originally excluded the Añasco area. A new intercept trunk from Añasco to Mayaguez has now been included in the planning and Añasco will definitely be included in the system.

Regional industrial waste system facility: Several meetings have been held with U.S. Environmental Protection Agency, EDA, Fomento, and Acueductos representatives regarding an Añasco-based industrial waste treatment plant capable of handling oils, detergents, and acids from pickling, electroplating, and electrolytic processes. Fomento and EDA have agreed to fund a $50,000 feasibility and preliminary engineering design contract. Present indications are that the plant will cost $1,000,000. A funding formula, tentatively agreed upon by all parties, calls for EPA to pay 50%, EDA 30%, Fomento 10%, private industry 10%. The plant would be operated by Acueductos on a user-fee basis.

Telephone and Telex facilities: The P.R. Telephone Co. has ordered equipment and scheduled the construction of a new microwave-serviced communications center for Añasco. (Those manufacturing companies operating in P.R. without this type of equipment can attest to the importance of this program.)

In arranging for these services and facilities, SPS found a ready willingness on the part of all government agencies to cooperate to their fullest extent. Limited budgets constituted the only real roadblocks, but in these cases, it was frequently found Federal aid programs (US Department of Commerce and the Environmental Protection Agency) could be made available to accomplish the needs. While this entire undertaking was a bit involved, it was marked by a sincere effort on the part of both Commonwealth and Federal agencies to do everything possible to aid the industrialization effort.

AÑASCO DEVELOPMENT PLAN

Puerto Rico's tax laws exempt leasehold income derived from tax-exempt manufacturing firms. The Añasco Industrial Park development plan is specifically designed for the generation of this type of tax-free income.

The plan calls for the formation of a development corporation which will provide custom--designed manufacturing buildings and facilities on a 20 year-lease basis to tax-exempt corporations. The industrial park

will be attractively planned with building set-back requirements, off-street employee parking, underground utilities, landscaping, individual sub-station power facilities, and complete water, sewage, and industrial waste treatment services. A Recreational park including softball, volleyball, and tennis facilities for industrial use will also be included. A 40-acre executive residential area which will provide all homesites with views of the Añasco Valley and the Caribbean Sea - together with a 3-acre recreational lake will be constructed on land adjacent to the industrial park.

All facilities will be protected by a strict, but fair, set of covenants that will guarantee the protection of the high quality standards we are determined to maintain.

The marketing strategy embraced in this particular development concept is to attract the U.S. manufacturing company that:

(1) is interested in locating in P.R. with a low capital investment.

(2) will not fit into a Fomento-type building, or wishes something more presentable.

(3) desires being in a 15 year tax exemption zone.

(4) would like to have a custom-built plant.

(5) wishes to be spared the problems associated with the construction of a new plant in unfamiliar surroundings.

(6) would like to be located in a park providing lawns, landscaping, off-street parking, and attractive neighboring plants.

(7) prefers being located in an area of ample, trainable labor which will be subjected to a minimum of labor piracy and union organizing.

(8) wishes to be located close to air, truck, and deep water transportation facilities.

(9) would be interested in lease rates comparable to those in the States for similar facilities.

(10) would consider it a plus to have an attractive, executive housing area for its key personnel minutes away from the park.

All the above are provided in this development plan.

FINANCIAL CONSIDERATIONS

In developing profit expectancies for any new venture, assumptions understandably have to be made. Those contained in this analysis have been selected as carefully as possible and, in our opinion, realistically. The financial approach used in developing estimated profits are consistent with formulae used by similar industrial park operations in the States.

As to marketing sales (in our case, lease activations) we have assumed a total of 12 tenants joining the development at the rate of 3 per year (1973-76) and that they will occupy space in increments of 20%, 20%, 20%, 40% of the total 720,000 sq.ft. planned over the 4 year period.

THE PROJECT PLAN

The initial effort in implementing the plan calls for site improvements on Parcels A and B during the winters of '71-'72 and '72-'73. See Figure B. This would include streets, drainage, sewers, water lines, plus some earth fill and cost an estimated $570,000.

Site work for the residential areas (parcel C) would be coordinated with the Highway Authority's construction schedule for Route 405. Although this has not yet been announced, we are assuming the site work on this tract ($150,000) will be completed in 1973.

Building construction: the project plan calls for no additional capital expenditures on the part of the development corporation. New plant construction will be undertaken only when a signed lease has been executed between the development company and a lessee. Leases presently are planned to be for 20 years-however, consideration may have to be given for a term of 17 years. (the period of 15 years tax exemption plus the 2 years start-up holiday)

Construction of all buildings tentatively will be handled by the Butler Manufacturing Company of Kansas City, Mo. Butler has agreed to make all preliminary engineering layouts and designs for prospective lessees, furnish cost estimates on a "not to exceed" basis,

provide their own construction financing during the construction period, and submit to audit their final construction costs.

The development corporation, in turn, will guarantee payment to Butler upon completion of the building. (These funds will be provided by banks or insurance companies on a mortgage loan basis.)

Industrial Park Income: Figure C presents projected industrial park leasehold income with 100% occupancy and assuming leaseable buildings occupy 1/3 of the land. This building/land ratio will generate 720,000 square feet of rentable space and leave 1,440,000 sq.ft. for lawns, landscaping, employee parking, and screened outside storage areas.

Construction costs will vary with the complexity and sophistication of the building. For the type building we have in mind, costs - in Puerto Rico - would

range between $10.00-$17.00 per sq. ft. for well-lighted, airconditioned, landscaped, specially designed plants. Figure C assumes an average construction cost of 13.00/Sq.ft.

Mortgage interest has been assumed to be 8%, operating expenses $100,000 per year, and depreciation on buildings has been set on a 40-year basis.

Indicated annual profit - assuming no interim escalation provisions were implemented - would total $1,214,000 per year for the fully leased park.

Tentatively proposed Lease Rates (based on a $13.00 per sq.ft. construction cost) are shown in Figure D. These rates are slightly lower than comparable U.S. lease rates.

Return on Investment was computed by dividing the $1,214,000 annual profit figure by various valuations we have estimated the combination package - the land, the program plan, and the ability to carry the plan out- might be construed to be worth.

Total Project Realization, besides totalling the realized cash flow for 20 years of lease income, shows estimated residual values of the land and buildings to the development corporation at a time when principle and interest payments theoretically will cease.

Cash Flow Projection - (Figure E) shows, on a year-to-year basis, an expectancy of how project expenses and income will relate based on the following new tenant occupancy schedule:

	New Tenants	New Bldg. Sq. Footage	Footage Percentage
1973	3	144,000	20%
1974	3	144,000	20%
1975	3	144,000	20%
1976	3	288,000	40%
		720,000	100%

MARKETING OUTLOOK

A number of factors contribute to a positive expectancy for negotiating leases for the Añasco Industrial Park.

A. Tax exemptions. Any industrialist, understandably would be--and is--interested in doubling his after--tax earnings. Puerto Rico's unique tax laws together with a special provision of the US Internal Revenue Code make this possible. This single fact is a tremendous attraction. (Fomentos' full--page ads in the Wall Street Journal and NY Times following Nixons' announcement on the 10% surcharge on non-US made imports resulted in 156 inquiries from mainland companies.)

B. Negating the negatives. The final decision to establish a plant in P.R. however, invariably rests upon a weighing of the negatives that offset the tax exemption attraction. The major ones always have been

(1) the capital required (for a new plant)

(2) the location selection ordeal (relative to adequate utilities, sewage and waste facilities, plus good transportation and communications services.)

(3) construction uncertainties, and

(4) how to select and train new employees

Negatives 1-3 automatically vanish with this development concept and the availability of SPS's first hand experience in training some 400 Puerto Ricans for its highly sophisticated manufacturing operation should certainly minimize any fears or uncertainties attached to Negative No. 4

C. Lack of competition. According to the Planning Board, no other industrial park developments of this type have been discussed or envisioned for any sector of Puerto Rico. There is good reason to assume that the success of the Añasco park will offer attractive expansion opportunities for the concept to other areas on the island.

D. Fomento's marketing help. A very strong factor is the marketing assist that will come through the efforts of 36 full--time Fomento representatives located in New York, Boston, Philadelphia, Chicago, Miami, Houston, and Los Angeles. This entire staff recently received a briefing on the project in Añasco and there was unanimous and enthusiastic agreement this development concept would be well received. In fact, a number of representatives felt they could return and reopen negotiations with firms that had been on the threshhold of locating in P.R., but had postponed their decision. The Fomento sales staff in the States will constitute a very definite asset to the project.

PROJECT MANAGEMENT

Direction of the project will be under Mr. Alan Bartholemy, Vice President of SPS, Inc.

Mr. Bartholemy prepared the original analysis that led to SPS's Puerto Rican investment, procured the land, negotiated the tax exemptions and incentive grants with Fomento and other Commonwealth agencies, coordinated the construction of SPS's 130,000 sq.ft. air-conditioned plant--one of the most modern on the island--, recruited supervisory personnel, implemented a model training program, and acted as Plant Manager during the first year of production. His 5 years accomplishments in Puerto Rico relative to all phases of this project as well as his pre-SPS experience highly qualify him for this assignment.

Prior to his Puerto Rican experience Bartholemy coordinated similar arrangements for the company's new facility in Galway, Ireland. This included a detailed project analysis, site determination, land procurement, governmental negotiations, and actual construction of the plant.

Before coming to SPS in 1965, he was a Division Manager with Aerojet-General Corporation's Liquid Rocket Plant in Sacramento in charge of Long Range Planning.

Directly before joining Aerojet he was Executive Director of the 1960 Olympic Winter Games in Squaw Valley, Calif. where he had the responsibility for the total planning, coordination, and implementation of all programs for the conversion of Squaw Valley into a site for the very successful Olympic Games. This highly intensive 4 year assignment involved working daily with architects, engineers, city planners, State, Federal, and international governmental leaders, as well as the Olympic Games sports organizations, and the communications media.

He is a former Marine Corps Captain, a graduate of Yale, and now resides with his family in Puerto Rico.

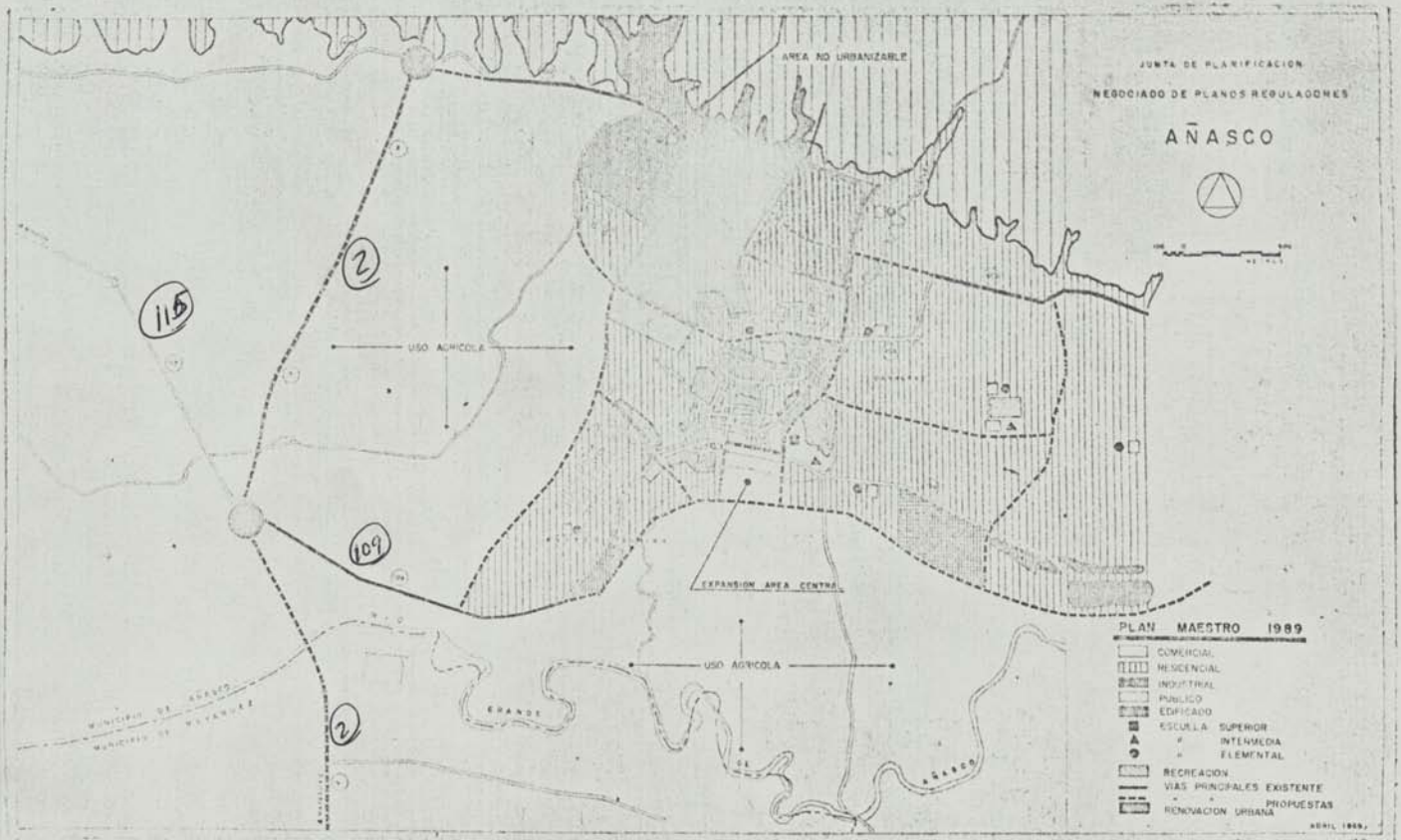
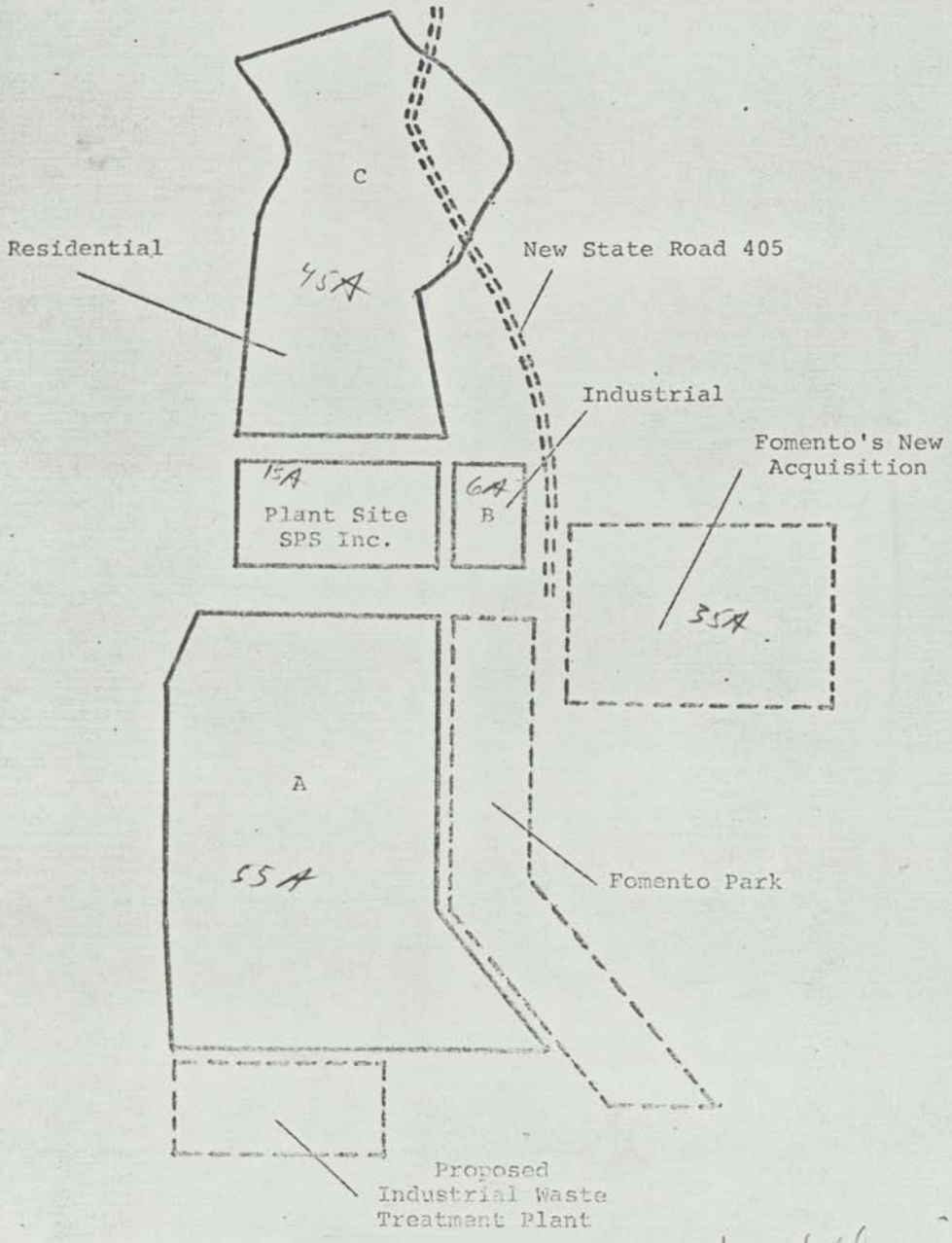

JUNTA DE PLANIFICACION
NEGOCIADO DE PLANOS REGULADORES
AÑASCO
AREA NO URBANIZABLE
USO AGRICOLA
EXPANSION AREA CENTRAL
USO AGRICOLA
2
115
109
2
PLAN MAESTRO 1989
COMERCIAL
RESIDENCIAL
INDUSTRIAL
PUBLICO
EDIFICADO
ESCUELA SUPERIOR
INTERMEDIA
ELEMENTAL
RECREACION
VIAS PRINCIPALES EXISTENTE
PROPUESTAS
RENOVACION URBANA
ABRIL 1969

Figure A

Figure B



20" line 6M GPD

Leasehold [illegible]

ESTIMATED ANNUAL PUERTO RICAN LEASEHOLD INCOME

(dollars in 000's)

		Buildings Use 33% of Land (720,000 Sq.Ft.)
Industrial Land available	62 Acres	
Less: 20% for improvements	12 Acres	
Available Land for leasehold properties	50 Acres	2,160 M Sq.Ft.
Value of developed land	$80 M/Acre	4,000 M
Investment in buildings at construction cost of	$13.00/Sq.Ft.	9,360 M
Land development cost (streets, sewers etc.)		570 M
Total Investment		$13,930 M
Average (20 years) Annual interest expense 8% (declining)		557 M
Total Interest & Investment		$14,487 M
Annual Leasehold Income 1% per mo. per $ investment		12%
Leasehold Income from Properties to be Developed		$ 1,738 M
Leasehold Income from SPS Plant Facility		300 M
		$ 2,038 M
Leasehold expenses (Average)		
Interest (actual expense)	$482 M	
Operating	58 M	
Depreciation (40 yrs)	284 M	
Annual Profit before and after taxes		824 M
		1,214 M

P.R. Land Development
Return on Investment

Figure D

Assumed Project Valuation	R.O.I.*
$8,000,000	15.1%
7,000,000	17.3%
6,000,000	20.2%
5,000,000	24.3%
4,000,000	30.3%

*Tax-free to Puerto Rican investors.

I have the feeling this could be as low as $3M DCK

Tenant Lease Rates

Custom Building Cost per Sq.Ft.	Annual Lease Rate per Sq.Ft.
$10.00	$2.04
11.00	2.16
12.00	2.29
13.00	2.41
14.00	2.54
15.00	2.66
16.00	2.79
17.00	2.91

Average Annual Positive Cash Flow

Annual Profit		$1,214,000
Depreciation	(plus)	284,000
Sub-total		$1,498,000
Annual Mortgage Principle Repayment	(minus)	568,000
Net Average Annual Positive Cash Flow		$ 930,000

Total Potential Project Realization

Realized Cash (20 yrs Xs avg annual cash flow)	$18,600,000
Land (assuming 100% appreciation 20 yrs)	8,000,000
Buildings (assuming 50% depreciated value)	5,680,000
Total Realization ...	$32,280,000

CASH FLOW PROJECTION

(dollars in 000's)

	INDUSTRIAL LAND			RESIDENTIAL LAND		EXPENSES				INCOME
	Dev. Costs (Borrowed)	Est. Income	Princ. & Int. (Level Pymts)	Dev. Costs (Borrowed)	Est. Income	Loan Repayments (Ind)	Loan Repayments (Res)	Loan Int.	Adm. Costs	Total Net
1972	350*	300	-	-	-	-	-	(31)	(75)	194
1973	220*	647	(188)	50*	-	(114)	-	(45)	(100)	200
1974	-	994	(376)	100*	-	(114)	-	(44)	(100)	360
1975	-	1341	(564)	-	~~273~~ 201**	(114)	(30)	(31)	(100)	775
1976	-	2038	(940)	-	~~301~~ 221**	(228)	(30)	(8)	(75)	1058
1977	-	2038	(940)	-	~~331~~ 243**	-	(90)	-	(50)	1289
1978	-	2038	(940)	-	~~364~~ 268**	-	-	-	(50)	1412
1979	-	2038	(940)	-	-	-	-	-	(50)	1048
1980	-	2038	(940)	-	-	-	-	-	(50)	1048
1981	-	2038	(940)	-	-	-	-	-	(50)	1048
1982	-	2038	(940)	-	-	-	-	-	(50)	1048
1983	-	2038	(940)	-	-	-	-	-	(50)	1048
1984	-	2038	(940)	-	-	-	-	-	(50)	1048
1985	-	2038	(940)	-	-	-	-	-	(50)	1048
1986	-	2038	(940)	-	-	-	-	-	(50)	1048
1987	-	2038	(940)	-	-	-	-	-	(50)	1048
1988	-	2038	(940)	-	-	-	-	-	(50)	1048
1989	-	2038	(940)	-	-	-	-	-	(50)	1048
1990	-	2038	(940)	-	-	-	-	-	(50)	1048
1991	-	2038	(940)	-	-	-	-	-	(50)	1048
1992	-	2038	(740)	-	-	-	-	-	(50)	1048
1993	-	2038	(552)	-	-	-	-	-	(50)	1248
1994	-	2038	(364)	-	-	-	-	-	(50)	1436
1995	-	2038	(176)	-	-	-	-	-	(50)	1624
1996	-	2038	-	-	-	-	-	-	(50)	1812
	(570)*	46,080	(17,779)	(150)*	1,269	(570)	(150)	(159)	(1450)	27,221

*denotes loans. Repayment is shown in columns headed "Loan repayments - Industrial - Residential".

** net, after-tax effect (40%)

11/11/71

Figure E

Puerto Rico

memo
XR Environmental Lms

digital INTEROFFICE MEMORANDUM

TO: JOE ST. AMOUR
CC: F. BOWERS B. HANSON
R. CAJOLET B. HOPLEY
A. HANSON B. PLANTE

DATE: DECEMBER 1, 1971

FROM: GEORGE WOOD, 1-4

DEPT: MFG. ENGINEERING

cc file Don Gates P Mackey

SUBJ: TRIP REPORT

This trip involved attention to numerous problems. The reporting format below separates them by subject for your easy reference.

SUBJECT

Corrosion Problem in the Plating Room (Rusting)

HISTORY

Air analysis was taken by Environmental Research and Applications Inc. Consultant study was conducted by Daniel Engineers.

APPROACH

In addition to the above, Barry Reisch of Chemcut looked at the etcher as a possible contributor.

CONCLUSION

All parties agree that the chlorine content in the etchant is the primary source of rusting, and that the best approach toward solving the problem is to isolate the source.

FOLLOW-UP

P. Mackey and Don Gates will propose a design for enclosing the etcher and exhausting the enclosure. The unit is to be installed and working by January 1, 1972.

SUBJECT

High Speed Cupric Chloride System

HISTORY

A simple addition to our standard system was producing some complicated problems.

APPROACH

Vendor representative was brought to San German to adjust the system, retrain the operator and familiarize Fred Bowers with the operation, control and maintenance procedures.

CONCLUSION

Vendor representative was unable to demonstrate sufficient equipment capacity to do the job.

FOLLOW-UP

Vendor (Chemcut Corp.) has been given until December 6th to make a complete and adequate proposal to put the system (or an alternate system) in order. If they fail to do so, I will return the equipment in and recover our investment.

SUBJECT

Upgrade the Automatic Gold Plater

HISTORY

Joe Hynes had made parts to modify and improve the operation of the machine.

APPROACH

Joe and Julio (maintenance man in Puerto Rico) installed at least one of everything to determine if: the part fit, the modification worked and any other problems occurred.

FOLLOW-UP

Julio will - 1. Dismantle stations 3 and 7 and tie in with the main air cylinder.

2. Disconnect the air cylinders and controls for stations 3 and 7 (these controls can be used as spares).

3. Mount the new rollers and bushings on the carrier arms (they should be greased first).

4. Mount the new chain links on the main drive chain.

Fred will - 1. Get the electrician to review the marked-up electrical drawing and disconnect the safety microswitches to stations 3 and 7.

2. Get the dimple in the track filled in as a low priority item.

Bill will - 1. Get the hand-line in operation.

I will - 1. Get new springs to the new length and send them to Fred for installation.

2. Order a new rack alignment jig and send it to Fred.

SUBJECT

Set Up 2 Ton Punch Press and Start Cable Board Notching

HISTORY

Machine was received incomplete.

APPROACH

Joe Hynes ordered parts, installed them, set-up the machine and instructed an operator.

CONCLUSION

The punch works, but Bill Plante is concerned about the slowness of the operation, the fact that Maynard Board Fab. uses the machine shop and what would happen when all the work comes to Puerto Rico.

FOLLOW-UP

Bill will check the schedule plan against board types done on this press and forecast any requirement for additional punching capacity such as a Diacro or Strippit press.

SUBJECT

Waste Treatment (Operation and Control)

HISTORY

To-date the operation and control manual was incomplete, minor discrepancies appeared on the daily reports and a unexplained source of copper was evident in the effluent.

APPROACH

I brought down revised copies of the instruction and operation catalogs and adjustment procedures, discussed the discrepancies in the daily reports and the data sheet for sampling (an attempt to locate the copper source).

CONCLUSION

The instruction manual needs further revision and clarification, discrepancies now understood and will be corrected and the essence of the sampling plan understood.

FOLLOW-UP

1. Construct a simple block diagram of the process.

2. Write to Leeds & Northrop about the malfunctioning of the pH strip chart.

3. Get a filter and pump for the scrubber settling tank to eliminate that as a copper contributing source.

4. Write to Crane Deming about the poor service and handling of our order for a replacement part (after 2½ months the part arrived damaged).

5. Revise the data sheet for the sampling plan.

6. Check on the need to flush and rinse the collection tanks to the suggested schedule.

7. Check with Al Rimer on the capacity limitations of the caustic transfer pump.

Luis Velez will - 1. Complete the "as built" drawing of the waste treatment plant and send it to me.

SUBJECT

Method of Draining Seal-Brite from the Coating Machine

SOLUTION

Fred Bowers will solve this problem in Puerto Rico.

SUBJECT

Inadequate Response from Vendor on Parts & Materials to Support Gold Plating

HISTORY

Several instances of delay with poor communications and misunderstandings.

APPROACH

The following people met to work out a common unified approach to doing business.

Collin Stevens ---- V.P. Sales, Sel-Rex

Frank Dillon ------ Manager, Customer Service, Sel-Rex

Charles Stopford -- Sales/Service Representative, Sel-Rex

Tom Cook ---------- Purchasing, DEC De Puerto Rico

Wally ------------- Purchasing, DEC De Puerto Rico

Bill Plante ------- (Production) DEC De Puerto Rico

Fred Bowers ------- (Engineering) DEC De Puerto Rico

George Wood ------- (Engineering) DEC Maynard

CONCLUSION

Most problems will be solved by closing the communications gap. Frank Dillon will be the central source at Sel-Rex for all types of problems. If he can't answer the question, he will get someone to answer it.

FOLLOW-UP

Wally and Frank will set up a method of notices by TWX and timed response in order to assure receipt of order and receipt of goods.

I will work through Ed Schwartz to get our gold license increased to 750 ounces and accept Frank Dillon's offer to help if I need it.

SUBJECT

Methods and Equipment for the Safe Handling of Ton Cylinders of Chlorine.

HISTORY

The vendor who supplied the 150 pound cylinders of chlorine couldn't furnish reliable delivery.

APPROACH

Bill Plante purchased a ton container from PPG (Manufactuers chlorine right on the island).

FOLLOW-UP

Bill Plante will - 1. Work out the details of owning buying cylinders, spares and deliveries.

2. Arrange with PPG for a safety training course.

3. Provide temporary protection for the cylinder of chlorine.

4. Get the leak in the shed roof fixed (directly above this area)

I will ---------- 1. Order a safety caping kit.

2. Order a Scott Air Pack.

3. Order 4 pocket escape respirators

4. Order 4 trunions

5. Look into a fork lift for unloading the cylinders.

6. Set up another safety training course with Guzeman Associates.

7. Work on a "safe" barrier or location with Al Hanson.

GW/acp

Puerto Rico

memo
XR Land

digital INTEROFFICE MEMORANDUM

TO: A. Hanson

DATE: October 12, 1971

FROM: D. Knoll Dave

DEPT: Mfg.

CC
✓ file
Geo Burke
Aw H.

SUBJ: FIRST PASS SPECIFICATIONS FOR NEW PUERTO RICAN SITE

1. Must be in 17 year exemption area.
2. Size: 35 acres (minimum)
   50 acres (desirable)
   100 acres (maximum)

   500K sq.ft. ultimate = 11 acres
   x 4
   44 acres
3. Terrain: Buildable site for 500K sq.ft. single story building. The balance is for parking, grounds, etc.
4. Utilities requirements:
   Electricity - same as Ireland large site. Somehow I feel we ought to be close to the main line which circles the island.
   Water - same as Ireland if this is possible. If not, what is?
   Effluent - for water and effluent, assured access at a price is OK for now, as opposed to having this much at the site now.
5. No value to railroad spurs, etc.
6. Nearness to airport desirable -- must be decent road to airport in any event.
7. Surrounding area should have 25,000 people or more within commuting distance.
8. Access to technical labor desirable, i.e. engineers, technicians, mechanical and electrical. (This might lead one toward Ponce.)
9. Closeness to educational facilities desirable -- universities, technical schools, night schools.
10. Must be generally south of Aquadilla and west of Ponce.
11. Typical good towns, location-wise, might be Anasco, Moca, Aguada, Yauro, Cabo Rojo.
12. May have fairly heavy floor loadings and equipment pads; should not be in wetlands.

Please come back with any specific questions you may have, and check with me before you get anyone else involved in this.

jkl

P.R. 1971 memo file

ZOZC PR
TO BILL PLANTE
CC AL HANSON
FROM GEORGE WOOD

I SPOKE WITH AL HANSON ABOUT THE SERIOUS RUSTING PROBLEM YOU ARE HAVING IN THE PLATING ROOM. HE WILL SEND SOMEONE DOWN THE FIRST PART OF WEEK TO ANALYZWE THE ATMOSPHERE. AS SOON AS WE KNOW WHAT IS CAUSING IT, WE WILL GET BUSY ON A SOLUTION.

GW-
-+D

digital INTEROFFICE MEMORANDUM

SEP 24 1971

to

TO: Al Hanson
Ed Schwartz
D. Knoll
B. Hanson

DATE: September 23, 1971

file

FROM: George Wood 1-4

DEPT: Mfg. Engineering

SUBJ: PERMIT TO OPERATE IN SAN GERMAN

About two months ago Ray Carlson:

- Discovered that we needed Board of Health approval to start up in San German.

- Contacted people at Sam P. Wallace who verified this and offered to help.

- Set up a meeting with DEC, Sam P. Wallace, Camp Dresser and McKee (CDM), and Victor Garcia Assoc.

Since then, we have endeavored to get a permit for C.D.M. to work in Puerto Rico thru the influence of Victor Garcia. Yesterday, all this came to an end - no permit.

All that this means is that CDM did not get temporary professional recognition in Puerto Rico, and is not allowed to present drawings and plans under their professional engineering seal.

Note: To-date - no government official or agency has questioned or challenged our right to operate.

Our approach from here on can be anything from sit-back-and-do-nothing to hiring an island based professional engineer. I am inclined to do nothing and depend on Aquaducto to back up their commitment if it comes to a showdown, but I'm not sure I have a good measure of all the risks. Please let me have your thoughts on this matter.

GW/acp

Thoughts
① Continue to operate!
② Hire the plant engr that was requirement (He must be a professional engr.).

Dave

DEC 5-1043-D

digital INTEROFFICE MEMORANDUM

TO: Al Hanson
Ed Schwartz
D. Knoll
B. Hanson

DATE: September 23, 1971

FROM: George Wood 1-4

DEPT: Mfg. Engineering

SUBJ: PERMIT TO OPERATE IN SAN GERMAN

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GW/acp

DEC 5-1043-D

P.R.

memo #173

digital INTEROFFICE MEMORANDUM

TO: Central Planning
A. Hanson

DATE: September 15, 1971

FROM: W. Hanson

DEPT: Component Manufacturing

SUBJ: Lon Beaupre's Memo (Attached)

I concur totally with Lon's memo and request that effective immediately all hotel bills be picked up by the traveller (Maynard Cost Center) and not billed to DEC de Puerto Rico.

Lon is attempting to renegotiate a contract with the Hilton whereby we will lease no rooms but rather will receive some discounted rate because of our overall volume.

/kb
Attachment

Copies
P Mackey.
A Craffey
E Kalwell
file.

9/10/71

To: Bill Hanson
From: Lon Beaupre

The Hilton situation is as follows:

As of today 9/10 we have no rooms under contract. The new price is $20 per night single occupancy and $24 per night double occupancy. This is the standard commercial rate at the hotel. I believe this is a legal price increase on their part since our contract had expired last June and the new price they are charging us is the same that they have been charging all other commercial customers.

We have been unable to contact the manager to renegotiate and expect to try that next week. In the meantime we should all assume that nothing will change and that the negotiations will fail. On this premise and to bring a little pressure we have advised the assistant manager that starting today we will pay only for rooms which are occupied and for specific nights of occupancy. In other words we are leading them to believe that we will not contract with them again.

I believe the whole Hilton situation is out of control anyway. We are paying expenses for many people without seeing the detail backup of those expenses. Cost Center Managers are not seeing exactly what these trips are costing and on what the mony is being spent. We have no way of knowing in Accounts Payable whether we are paying the correct amounts. The new situation will be even more confusing for us with the variable room rate depending upon occupancy.

We make reservations for people and when they arrive they give the hotel different instructions. In the case of Ed Mayall and Jack Grieve who are here now we reserved a double at $24 and advised Maynard travel of that and the reasons why. However, when they arrived they checked into two singles at $40 per day. Since we pay the bill they never have to justify this to their own Cost Center Manager. My suggestion is that each visitor pay his own way starting immediately. This means he pays his own hotel expenses when he checks out. This gives good control as he will see the detail expenses and may check them a little more carefully. Let the expenses go on the cost center involved so the cost center manager can see what his people are spending.

If the company wants to allocate all or a portion of that expense to PR on a monthly basis that is okay with me.

Please advise ASAP.

Memo re Waste Treatment

digital INTEROFFICE MEMORANDUM

TO: L. Beaupre, R. Carlson, A. Hanson, W. Hanson, D. Knoll, E. Schwartz

DATE: July 15, 1971

FROM: George Wood

DEPT:

SUBJ: STATUS - PERMIT FOR WASTE TREATMENT IN PUERTO RICO

On Wednesday, June 30, 1971, Ray Carlson, Al Rimer of Camp Dresser & McKee, Peter Gonzalez of Sam P. Wallace Inc., and I met with Victor M. Garcia and Manuel Fernandez of Victor M. Garcia Associates. The purpose of the meeting was to establish a means for Camp, Dresser & McKee to get a special permit - and therewith make application to the Board of Health for a permit to dump treated process waters into the San German sanitary system.

Attached is a July 6, 1971 letter to Camp, Dresser & McKee for reference. Also attached is copy of a letter to the Board of Examiners in Puerto Rico. This letter was delivered to Victor Garcia Associates and will be submitted by him (along with an application from C.D.M.) to the Board of Examiners. This action was planned for Thursday, July 15, 1971.

GEORGE

Attach. (2)

mkf

cc D. Machen, R Carlson, file

DEC 5-1043-D

correspondence
Re: Hiring of Camp, Dresser & McKee

digital

July 13, 1971

Architect Augusto Gautier
President of the Board
Board of Examiners for
Engineers, Architects, & Surveyors
Department of State
San Juan, Puerto Rico

Dear Sir:

The design of the facility for process water control in our plant in San German, Puerto Rico, demanded close contact and experimentation at frequent intervals during the past several months.

It was for this reason that we hired the Massachusetts firm of Camp Dresser and McKee to engineer the facility.

I would appreciate any consideration of this situation when you act on Camp Dresser and McKee's application for a special permit.

Very truly yours,

George H. Wood

George H. Wood
Facilities Planning
Manager

GHW/ee

DIGITAL EQUIPMENT CORPORATION de PUERTO RICO POST OFFICE BOX 108 SAN GERMAN, PUERTO RICO 00753
(809) 892-1231 TWX: 385439 DIGITAL PR

Correspondence
KR Waste Treatment
George

digital

July 6, 1971

Camp, Dresser & McKee
1 Center Plaza
Boston, Massachusetts 02109

Attention: Mr. Alan Rimer

Dear Al:

Please proceed as planned to further discuss the waste disposal problems with Victor Garcia Associates. This letter will serve to extend our present purchase order no. P.R. 1188 so as to include hiring Victor Garcia Associates as consultants to Camp, Dresser & McKee.

It is my understanding that Mr. Garcia has offered to assist, by introducing you to the proper authorities, with whatever explanations are necessary, so that you will be granted a special permit -- and this permit will entitle you to make a proposal to the Board of Health in Puerto Rico.

Please advise me immediately of any assistance you need in this regard or if anything happens to prevent Digital from obtaining the necessary permission to dispose of the waste water.

Since Mr. Garcia has already seen the facility and since you plan on seeing him the first part of this week, would you please call me before Friday, July 9th, and give me a brief outline of your approach and a schedule of events.

Very truly yours,

George H. Wood

GEORGE H. WOOD
Facilities Planning
Manager

GHW:cl

DIGITAL EQUIPMENT CORPORATION, 146 MAIN STREET, MAYNARD, MASSACHUSETTS 01754
(617)897-5111 TWX: 710-347-0212 TELEX: 94-8457

CC: Mr. Robert Marini (partner)
Camp, Dresser & McKee
1 Center Plaza
Boston, Massachusetts

Dr. Robert Culver
Camp, Dresser & McKee
1 Center Plaza
Boston, Massachusetts

DIGITAL EQUIPMENT CORPORATION

memo
XR Insurance
file

digital INTEROFFICE MEMORANDUM

DATE: June 21, 1971

TO: Lawrie Best

FROM: Howard Austen

DEPT: Corporate Insurance

SUBJECT: FIRE PROTECTION - FACILITIES IN PUERTO RICO

I was pleased to read the information sent to you by Marsh & McLennan on the cost of insurance against Fire and Allied Perils in Puerto Rico. This certainly calls to our attention the value of approved FIA and FM protection requirements.

To summarize: using a building value of $500,000; a contents value of $4,700,000; and a business interruption value of $14,000,000 we are faced with the following - A Total Annual Premium of $263,767. when the fire protection is not adequate and approved by the companies mentioned versus a $16,500. premium with approved protection.

This information should be of great value when discussing the cost for proper water supplies.

/mef

cc: Al Hanson
Al Bertocchi

digital INTEROFFICE MEMORANDUM

SUBJECT: FACILITIES SCHEDULING NEW BOARD FABRICATION SHOP - PUERTO RICO

DATE: February 8, 1971

TO: Greg Bacon

FROM: Tony Bader

cc: A. Hanson
D. Knoll
W. Plante
G. Wood

DEPARTMENT: Facilities Planning

Subsequent to our meeting of February 4, 1971, I had the notes from our discussion typed up. Please let me know if they are O.K. and I will use them as our schedule. If not, please indicate what changes you would like to make.

TONY BADER

TB:cl

PUERTO RICO BOARD FABRICATION SHOP

PLANT ENGINEERING

SCHEDULE OF EVENTS

EVENT	AREA OR PERSON RESPONSIBLE	COMPLETION DATE
1. Design Starts	Plant Engineering	2/8/71
2. Process Equipment Layout Finalization	Wood	2/10/71
3. Process Equipment Specifications Finalization	Wood	2/15/71
4. Preliminary Design Review (Architectural and Mechanical Drawings Complete	Plant Engineering	3/1/71
5. Approval of Preliminary Design (No major changes after this date)	Plant Engineering/ Wood	3/1/71
6. Long Lead Equipment Purchase Finalization	Plant Engineering	3/1/71
7. Pete Mackey		
A. Review Design at Puerto Rico To Insure Building data correct	Plant Engineering	3/1/71
B. Interview Prospective Bidders	Plant Engineering	3/1/71
8. Equipment Shipment	Plant Engineering	3/15/71
9. Finalize Design Documents	Plant Engineering	4/5/71
10. Approve Design Documents	Plant Engineering/ Wood	4/5/71
11. Forward Approved Documents To Pete Mackey for Contract Set-Up	Plant Engineering	4/5/71

EVENT	AREA OR PERSON RESPONSIBLE	COMPLETION DATE
12. Start Construction	Plant Engineering	4/12/71
13. Major Construction To Be Completed	Plant Engineering	6/14/71
14. All Construction To Be Completed And Final Connections To Process Equipment	Plant Engineering	6/28/71
15. All Construction Completed Except Miscellaneous Clean Up As Required	Plant Engineering/ Wood	6/68/71 - 7/15/71

P.R. Memo A. HANSON

digital INTEROFFICE MEMORANDUM

file

TO: Distribution

DATE: May 18, 1971

FROM: G. Wood

DEPT: Facilities Planning

SUBJ: GOLD PLATING MACHINE EVENTS SCHEDULE

Since May 3, 1971, the automatic gold plater has been producing for Board Fabrication and by May 25th it will have produced gold plated fingers for 19 successive production days. Barring a major breakdown or malfunction, the machine will be shipped to Puerto Rico - events as follows:

Date	Event	Person Responsible
5/3/71	Production Start-up	G. Wood/C. Tatta
5/20/71	Make arrangements for gold barrels	B. Cote/H. Chartrand
5/20/71-5/24/71	Make crates for rectifiers etc.	T. Bader/R. Leger
5/24/71	Machine frame in place and weld	G. Silva
5/25/71	Production stop at noon Transfer gold to barrels Drain Machine	G. Wood/C. Tatta B. Cote/H. Chartrand B. Cote/Hank Chartrand
5/25/71 5/26/71	Disconnect Plumbing Disconnect Wiring Disconnect Air	G. Silva
	Secure loose machine parts & crate for export	R. Leger
5/27/71	Load on rigger's truck	D. Gates/G. Silva/ T. Bader/R. Michel
5/28/71	Transfer to sea-land truck	R. Michel Rigger
6/1/71	Order gold on P.R. P.O.	W. Plante/G. Wood

Date	Event	Person Responsible
6/12/71- 6/14/71	Unload at San German	P. Mackey/R. Michel
6/14/71	Advise Sel-Rex of Machine arrival	G. Wood
6/14/71- 6/22/71	Installation 1. Set in place 2. Level and grout 3. Connect plumbing, electricity, and air	G. Silva/P. Mackey and others
6/22/71- 6/26/71	Installation (con't) 1. Final level adjustment 2. Mechanical checkout 3. Pin adjustments as required	Sel-Rex/G. Wood/B. Plante
6/28/71- 6/30/71	1. Make-up gold solutions 2. Plate trial lot 3. Adjust the machine 4. Start production	Sel-Rex/G. Wood/B. Plante

Note: If it becomes necessary to change this schedule, all those on this distribution list will be sent a revised copy.

Distribution:

T. Bader	D. Gates	J. LaBate	G. Silva
L. Beaupre	A. Hanson	R. Leger	C. Tatta
R. Carlson	W. Hanson	P. Mackey	
H. Chartrand	J. Harrigan	R. Michel	
B. Cote	D. Knoll	W. Plante	

Puerto Rico

memo XR Construction

digital INTEROFFICE MEMORANDUM

file PR

SUBJECT: CONSTRUCTION AND TRAINING SCHEDULES FOR PUERTO RICO START UP

DATE: April 16, 1971

TO: W. Plante

FROM: George Wood

CC: T. Bader
L. Beaupre
A. Hanson
W. Hanson
J. Harrigan
D. Knoll
P. Mackey

DEPARTMENT: Facilities Planning

Today Al Hanson committed himself to place the contract for the construction of the Board Fabrication Shop in Puerto Rico and Pete Mackey's plans call for him to be on the job no later than Tuesday April 20, 1971. Although this looks like a one week slip in the schedule, Al assured me that June 15th is still a good date for the completion of major construction inside the building.

Your concern over scheduling training sessions in Puerto Rico centers around your lack of specific knowledge of what equipment will be where on what date and so on. Pete Mackey's concern is that he cannot commit to the placement of specific pieces of equipment and still maintain enough flexibility to complete his job on time. He is also concerned that the training classes might get in the way of the workmen.

I have assured Pete that no one will get in his way, and in addition, Pete, Al Hanson, and myself have agreed on the following so as to help you schedule your training:

1. Pete will, as much as is practical, leave areas open and unoccupied during construction.

2. Al will supply technical help from Maynard to make temporary hook-ups to equipment if Pete or Lon cannot supply the help.

3. The space available for training then is:
   A. Open space during construction
   B. The entire area after 3 P.M.
   C. Space in a small building that Lon is renting down the street.

I would suggest further that your problems would be minimized if you scheduled the training so as to start on light equipment that is easy to relocate and from there go to the heavy equipment. A first pass sequence is as follows:

1. Shear - any location.
2. Inspect - any location.
3. Punch - temporary wiring and a long air hose.
4. Screen Prep - wash in buckets.
5. Screen - a can and a press with temporary wiring.
6. Drill - temporary wiring and no air conditioning.
7. OTHER AS REQUIRED
8.
9. Etch - after final hook-up.
10. Immersion Tin - after final hook-up.
11. Gold Plate - after final hook-up.

GW:cl

- Mary D - Central File
"In-Coming - Tom MacDonald"

memo

Digital INTEROFFICE MEMORANDUM

SUBJECT: CHECKOUT OF CUPRIC CHLORIDE ETCHANT SYSTEM IN BUILDING 11-1

DATE: March 22, 1971

TO: J. Harrigan

FROM: George Wood

CC: T. Bader
J. Bukkhegyi
B. Cote
D. Knoll
J. LaBate
T. MacDonald
W. Plante

DEPARTMENT: Facilities Planning

cc Ray Carlson
Lavrie B.
C.F. "In-Coming - TBM"

On or about April 15th we will receive a cupric chloride regeneration system from Chemcut. This system has been purchased for Puerto Rico, but because of its newness it will be tried out in "Print and Etch" so that we can become well acquainted with its use and maintenance.

This regeneration system will be installed, adjusted and started up by Chemcut people, but it will be necessary for us to do some work prior to installation, and then evaluate its use.

The tasks are outlined below. I have taken the liberty of assigning people to the tasks and will indeed discuss the program with each one in great detail. Because the time element is close, I will proceed assuming your full approval.

TASK	PERSON	TIMING
1. Order All Chemicals and Materials HCl Cupric Chloride Chlorine Safety Equipment	T. Bader	Prior to arrival of the regeneration system
2. Clean Out Spent Etchant Tank	B. Cote J. Bukkhegyi	Starting April 1st and continuing thru the actual installation
Add extra HCl to spent etchant dumps, rinse out the spent etchant		

	TASK	PERSON	TIMING
3.	Arrange for Truck Pick Up of Spent Ferric Chloride	W. Plante J. Bukkhegyi	Schedule to coincide with installation of the equipment
4.	Installation of Regeneration System	Chemcut/ G. Wood T. MacDonald J. Bukkhegyi	Shoot for a Sat. Sun. installation
5.	Installation of Chlorine Gas Cylinders	Chemcut T. MacDonald	Same as 4.
6.	Run and Maintain the System in Production	J. Bukkhegyi	Approx. 1 mo. duration
7.	Write-Up Operation and Maintenance Procedures	W. Plante	During production run
8.	Arrange for Spent Etchant Sale To Harshaw	G. Wood	As required in 3,000 gallon quantities
9.	Dismantle the Unit and Put "Print and Etch" Back in the Ferric Chloride Business	W. Plante T. MacDonald	After a 1 mo. production run
10.	Write Up an Evaluation Report	G. Wood	Prior to June 1

memo AL

FEB 16 RECD

digital INTEROFFICE MEMORANDUM

SUBJECT: EQUIPMENT TRANSPORT TO PUERTO RICO

DATE: February 12, 1971

TO: J. Cudmore
C. Kendrick
J. Smith

FROM: *George Wood

CC: Distribution

DEPARTMENT: Facilities Planning

Ray, Paul, Tony and I met recently to set up plans for the coordinated handling of equipment and materials that will be going to Puerto Rico for the new Board Fabrication Facility. The essence of our plan is shown below. Since you will also be sending materials and equipment, please feel free to contact me so that we can coordinate shipments, or to criticize or suggest changes to the plan:

1. All equipment will be purchased by Digital De Puerto Rico with instructions to drop ship to Maynard, Building 21-1, Attention: Ray Michel.

2. Equipment will be bought crated for export, if that is available at no extra charge. If not available, normal packing will suffice and Ray will crate here.

3. Nothing will be shipped in prior to March 1, 1971.

4. Building 21-1 (corrugated packing area) will be available after March 1, 1971 and will be used as a staging area.

5. Greg Bacon, Pete Mackey and I will break the equipment list down into three (3) categories namely: heavy equipment, light equipment requiring minimum installation and miscellaneous benches, shelves, materials, etc.

6. Equipment and materials will be loaded into vans by category and van numbers kept with contents lists so that Plant Engineering can unload in San German in an as needed, orderly fashion.

7. Most equipment will go by sea-land containers and, if necessary, van storage space will be established in San

German. Other delicate equipment such as controls, etc. will go by air freight.

I have also agreed to the following:

1. S.B.A.'s will be prepared, typed and available when equipment arrives in Maynard.

2. Nothing will be shipped to building 21-1 which weighs over five thousand (5,000) pounds.

3. Provide Ray with a complete equipment list marked up to show item number and category.

4. Provide Ray with a copy of all purchase orders.

NOTE: Larry Ricci has arranged for the collection of costs associated with this project and also for accountability for capital equipment, asset tags, etc.

Equipment Wiring Preference

480 Volt	3 Phase	60 Hertz
208 Volt	3 Phase	60 Hertz
208 Volt	1 Phase	60 Hertz
110 Volt	1 Phase	60 Hertz

GW:cl

Distribution:

GEORGE WOOD

*A. Bader
G. Bacon
L. Beaupre
H. Crouse
J. Fisher
A. Hanson
B. Hanson
J. Harrigan
D. Knoll
P. Mackey
*P. McGovern
*R. Michel
W. Plante
L. Ricci
D. Sullivan

Memo

JAN 26 1971

digital · INTEROFFICE MEMORANDUM

SUBJECT: RESPONSIBILITIES - BOARD FABRICATION IN PUERTO RICO

DATE: January 26, 1971

TO: D. Knoll

FROM: George Wood

cc: A. Bader
L. Beaupre
A. Hanson
W. Hanson
J. Harrigan
C. Kendrick
J. Smith

DEPARTMENT:

Copy Ray Carlson
G. Bacon
Tom MacD.
file P.R.
copies sent 1/27/71 mca

*Responsibilities for the construction and equipping of a circuit board fabrication shop in Puerto Rico have been established as follows:

ITEM	PERSON RESPONSIBLE
I. Waste Treatment	
1. Design and Specifications	Camp Dresser & McKee (CDM)
2. Engineering and Construction Cost Estimates	CDM
3. Approvals (Puerto Rico)	CDM
4. Equipment Contracts	Wood/Hanson
5. Equipment Installation	Hanson
6. Supervision of Field Construction	Hanson
7. Contract for the Continuing Analysis of Effluent	Recommendation by CDM
II. Production Equipment	
1. Purchasing	Wood
2. Scheduling	Wood
3. Procure Shop Drawing	Wood
4. Establish Utilities Criteria	Hanson
III. Facilities Engineering	
1. Plant Layout and Specifications	Hanson
A. Site Drawings	
B. Architectural Drawings	
C. Mechanical Drawings	

ITEM	PERSON RESPONSIBLE
1. D. Electrical Drawings E. Structural Drawings	Hanson
2. Coordinate Drawings and Specs with other Managers (Hanson, Smith, Beaupre)	Hanson
3. Purchase Facilities Equipment	Hanson
4. Schedule Equipment to Blend with Master Schedule	Hanson
5. Negotiate Construction Contracts	
IV. Field Construction and Supervision	
1. Supply a construction supervisor	Hanson
2. Negotiate contracts at job site	Hanson
3. Supervise installation of equipment per drawings and specifications	Hanson
4. Coordinate start-up with DEC production people	Hanson
5. Insure the completion of all punch list items	Hanson

Weekly meetings have been established between Al and myself to review progress and take action as required.

*I still remain responsible for the overall success of this program including: costs, timing and performance.

JAN 20 1971 memo

digital INTEROFFICE MEMORANDUM

SUBJECT: BOARD FABRICATION FACILITIES REQUIREMENTS IN PUERTO RICO

DATE: January 18, 1971

TO: Dave Knoll

FROM: George Wood

cc: Al Hanson
Tony Bader
Tom MacDonald

DEPARTMENT:

The proposed board fabrication shop for Puerto Rico will have a capacity of 18,000 panels/month expandable to 60,000 panels per month. It will be basically a print and etch type facility with thru connections being accomplished by way of griplets. It will occupy approximately 17,000 square feet of floor space with waste treatment being done external to the building. Below listed are the manufacturing areas by function with particulars on environmental control:

Area	Function	Sq. Ft.	Requirements
Plating	Gold Plating Tin Plating Etching Sealbrite	2900	Enclose to keep fumes out of other areas - treatment on floor for acid spills, etc. Walkways and floor drain--Exhaust as required.
Photo Prep.	Store master films and duplicate as required	450	Temperature 70°F ± 2°F Humidity 50% ± 3% Photographic dark room lighting and light control
Screen Prep.	Make screens from films and clean old screens	390	Temperature 70°F ± 2°F Humidity 50% ± 3% Yellow lighting availability

Area	Function	Sq. Ft.	Requirements
Lab	Chemical analysis of: Gold solutions Tin solutions Plating thickness Measurements Porosity checking	300	Enclose to keep out major dirt
Silk Screening	Image screening the circuits	1350	Temperature $70^{\circ}F \pm 5^{\circ}F$ Enclose to keep out major dirt and keep fumes in
Drilling	Circuit Board drilling	850	Temperature $70^{\circ}F \pm 2^{\circ}F$
Dispatch	Store drilling kits for 24 hrs. and schedule other work	400	Temperature $70^{\circ}F \pm 5^{\circ}F$

These environmental particulars and other facilities requirements are summarized in Table I. The cost of furnishing these in the existing plant in San German is as follows:

ITEM	COST MINIMUM	MAXIMUM	COMMENTS
Partitions	0*	10K	
Environmental	75	75K	
Electrical	20	20K	
Mechanical	45	45K	
Plumbing	15	15K	
Waste Treatment Plumbing	10	10K	
Totals	165	175K	

* Addition because of failure to exhaust system

TABLE I

EQUIPMENT UTILITY REQUIREMENTS

PUERTO RICO BOARD FABRICATION

	Item	Requirement
1.	Current (Amps)	
	At 380V/3Phase/60 Cycle (Equivalent)	388
	At 220V/3 Phase/60 Cycle (Equivalent)	150
	At 220V/1 Phase/ 60 Cycle	470
2.	Factory Air (CFM)	
	Steady at 85 PSI	55
	Intermittent at 85 PSI	50
3.	Water (GPM)	
	Tap	
	Filtered Tap at 70°F	25
	Filtered and Deionized at 70°F	67
	Total	10
		102
4.	Air Exhaust (CFM)	
	Internal	?
	External	22,000
5.	Air Conditioning (Sq. Ft.)	
	At 70°F ± 2°F	1,700
	At 70°F ± 5°F	1,750
6.	Humidity Control	
	At 50% ± 3%	840

Puerto Rico

Memo
XR Rand (Gov.)

digital INTEROFFICE MEMORANDUM

SUBJECT: Raimey Air Force Base DATE: January 14, 1971

TO: Stan Olsen FROM: Gene Cronin GC

DEPARTMENT:

I have been informed that Raimey Air Force Base in Puerto Rico is being considered for deactivation. No decision has been reached yet; however, a decision is expected by the end of the month. If the decision is to close, standard procedure would be to turn the base over to the Commonwealth of Puerto Rico.

GC:bm

digital INTEROFFICE MEMORANDUM

SUBJECT: PROPOSAL TO BUILD A CIRCUIT BOARD FAB SHOP IN PUERTO RICO

DATE: January 11,1971 Revision B

TO: Central Planning

FROM: G. Wood

DEPARTMENT: Facility Planning

I propose that we install a print and etch and Griplet Board Facility in the existing San German building. Key figures are below:

PRODUCTION LEVELS (CIRCUITS/MONTH)-SINGLE SHIFT
----ALL NUMBERS ARE TOTALS---

Circuits/Month Panels/Month	60K 17.5K (Present P.R. Level)	100K 29K	150K 44K	200K 59K
Space Req'd (Sq. Ft.)	17K	17K	20K	20K
Dollars Req'd				
A. Leasehold	$222K	232K	$245K	$245K
B. Capital Equipment	353K	456K	524K	528K
C. Less Eqpt. on Hand	-191	-276K*	-276K	-276K
D. Contingencies	+50K	+50K	+50K	+50K
E. Pipe In Water	---	+5K	+5K	+5K
F. Total	$434K	$467K	$548K	$552K
People Req'd				
Male	4	4**	6	
Female	43	79	114	
Total	47	83	120	
Timing				
1st Prod. 20K/Mon.	6 mos.	--		
All Boards	8 mos. (Standing Start)	6 mos. (Running Start)		
Water & Waste Treatment				
Req'd (GPM)	88 GPM	94 GPM		
Available	Yes	Wells nearby Sewage System Expansion Req'd		

* Based on an estimated $85K of equipment being freed up in Maynard.
**After 60K level-drilling and plating go on multiple shift.
**After 150K level screening, etching, scrubbing also go to multiple shifts

Long Lead Items - Waste Treatment Facility is judged to be longest lead item. Six months is a best estimate.

Risks and Limitation

1. Site has water for 60K production level only. Additional water located in wells 700 ft. away.

2. Sewer authority has capacity to take the waste for the 60K production level. Sewage plant expansion is now out for bids. D.E.C. negotiations should include a commitment to insure sewer capacity.

3. Griplet related equipment has the capacity to do 16K panels/month on a one shift basis. If necessary, well over 50% of the total board requirement could be made with griplets by running some of the machinery for more than one shift.

Attachments:

A. Leasehold Investment

B. Capital Equipment Requirements

G. Wood
A. Bader
January 11, 1971

LEASEHOLD INVESTMENT - PUERTO RICO

ITEM	PRODUCTION LEVEL 60K	100K	150K	200K	Total
Environmental	$75K				$75K
Electrical	17K		$3K		20K
Partitions	10K				10K
Mechanical					
1. Air Make-Up Air Exhaust Rigging Transportation	35K		10K		45K
2. Plumbing	15K				15K
Sub Total	152K		13K		165K
Water Treatment	10K				10K
Waste Treatment	50K	10K			60K
Waste Treatment Plumbing	10K				10K
Grand Total	$222K	$10K	$13K		$245K

12/22/70
Updated 1/11/71
Walter Bonin
George Wood

INVESTMENT COMPARISON - PTH VS. ETCH VS. GRIPLET

Facility Investment (original purchase/book value)

	PTH		ETCH		Griplet (59K Panels/Mo. @ P.R.)						
					New	On Hand		Transfer		Total	
	Orig.	Book	Orig.	Book		Orig.	Book	Orig.	Book	Orig.	Book
1. Equipment ($K)											
Punch	$2	$1	$2	$1	$5	$5	$4	$5	$3	$15	$12
Drill	96	60	146	91	43	38	30	73	60	154	133
Sand	2	1	2	1	1	5	4			6	5
Scrub			20	6		8	6			8	6
Wet Hone	19*	12									
Deposition	13*	3									
Screen	5	4	6	5	29					29	29
Photo Resist	48*	30									
Pattern Plate	31*	20									
Solder Plate	16*	15									
Etch	17	6	16	9		14	12			14	12
Strip Solder	1*										
Gold Plate	25	18	8	6	16	115	115			131	131
Shear & Bevel	8	5	4	3	5	4	3			9	8
Reflow	13*	10									
Tin Plate			8*	2	6			7	6	13*	12
Blank	8	6			10					10	10
SealBrite					8					8*	8
Griplet					71					71*	71
Other (Misc.)	17	10	9		58	2	1			60	59
Equipment Total	$321	$201	$221	$124	$252	$191	$175	$85	$69	$528	$496
2. Facilities ($K)											
Electrical	$28	$12			$20	($35)				$20	$20
Plumbing	26	11			15	(35)				15	15
Other Leasehold	57	23			130	(156)				130	130
Contingencies	0	0			50	(50)				50	50
Pipe In Water	0	0			5	(5)				5	5
Sub Total	$111	$46			$220	($271)				$220	$220
Waste Treatment	33	14			70	(60)				70	70
Water Treatment	9	4			10	(0)				10	10
Facilities Total	$153	$64			$300	($341)				$300	$300
3. Gross Total	$474	$265	$221	$124	$552 ($593)	$191	$175	$85	$69	$828 ($869)	$790

( ) Estimate as of December 1970

* Denotes investment unique to that process. For P.T.H. the unique investment was:

Orig.	Book
$141K	$90K

PUERTO RICO - CAPITAL EQUIPMENT REQUIREMENTS

* Items on hand in Westfield
** See last entry
*** Equipment Transfers from Maynard

REQUIREMENTS BY VOLUME (CIRCUITS/MONTH)

ITEM	UNIT COST	60K		100K		150K		200K	
		# Req.	$	# Req.	$	# Req.	$	# Req.	$
Lift Truck	(2000.00)	1	2000	-		-			
Rack 8' x 30"	**	-		-		-			
Rack 8' x 15"	**	-		-		-			
Rack 12' x 15"	**	-		-		-			
File Cabinets 4 dr.	57.00	1	57	1	57	1	57	1	57
Standard Desk	80.00	1	80	-		-			
Table, 2' x 4'	40.00	1	40	-		-			
22 Ton Press	4600.00	1	4600*	1	4600***	1	4600		
Die Rack, Heavy	100.00	1	100	-		-			
Die Lift	250.00	1	250*	-		-			
Conveyor 18 x 10'	**	-		-		-			
Conveyor 18 x 15'	**	-		-		-			
Stool	32.00	1	32	-		-			
Heavy Shelving 4' x 20' x 8" high	200.00	1	200	-		-			
Rack 2' x 20' Heavy	100.00	-		1	100	-		1	100
Foot Shear	775.00	1	775*	-		-			
Table 2' x 5'	78.00	1	78	-		-			
Rack 15 x 8'	**	-		-		-			
Conveyor 18 x 15'	**	-		-		-			
Conveyor 18 x 5'	**	-		-		-			
Sanding Deburring Mach.	4762.00	1	4763*	-		-			
Torit Cyclone	1234.00	1	1234	-		-			
N.C. Drill	38455.00	2	38000*	2	73000***	1	42000		
Vacuum	420.00	1	840	1	420***	1	420	1	420
Table 3' x 3'	30.00	1	30	-		-			
Bench 2' x 3'	30.00	-		1	30	1	30		
Bench 2' x 4'	30.00	-		-		1	30	1	30
Table 8' x 3'	50.00	1	50	1	50	-			
Table 6' x 3' Gen. Purpose	78.00	-		-		-			
Hi Speed Drill Press	220.00	1	220	-		-			
Tape Rack	30.00	1	30	1	30	-		1	30
Rack 4' x 15"	**	-		-		-			

PUERTO RICO - CAPITAL EQUIPMENT REQUIREMENTS

1/11/71

Requirements by Volume (Circuits/Month)

ITEM	UNIT COST	60K		100K		150K		200K	
		# Req	$	# Req.	$	# Req.	$	# Req.	$
Rack 10' x 15"	**	-		-		-			
Fick Press	300.00	1	300	-		-			
Rack 15" x 20'	**	-		-		-			
Bench 3' x 4'	30.00	1	30	-		1	30		
Inspection Bench	150.00	3	450	3	450	3	450	3	450
Inspection Lights	15.00	3	45	3	45	3	45	3	45
Soldering Irons	5.00	3	15	3	15	3	15	3	15
Bench Lights (mag)	.25.00	3	75	3	75	3	75	3	75
Rack 15" x 18'	**	-		-		-			
Rack 15" x 4'	**	-		-		-			
Chair	21.00	3	63	3	63	3	63	3	63
Sommaca Scrubber	7615.00	1	7615*	-		-			
Screen Wash	400.00	1	400	-		-			
Vacuum Frame	250.00	1	250	-		-			
Hydro-Lite	(200.00)	1	200	-		-			
Tri-Sink	200.00	1	200	-		-			
Film Cabinet 2' x 3'	180.00	1	180	-		-			
File Cabinet 4 dr.	57.00	1	57	1	57	-		1	57
Table 3' x 7'	50.00	1	50	-		-			
Work Bench 2' x 7'	69.00	1	69	-		-			
Screen Jig - Hi Vacuum Pump	2344.00	1	2344	-		-			
Film File 4' x 3'	200.00	1	200	-		-			
Vacuum Frame	250.00	1	250	-		-			
Work Bench 3' x 6'	69.00	1	69	-		-			
Bench 3' x 2½'	30.00	-		1	30	-			
Punch	150.00	1	150	-		-			
Gen. Purpose Light Table	78.00	1	78	-		-			
File Cabinet 4 dr.	57.00	1	57	-		-			
Viewer	80.00	1	80	-		-			
Dryer	175.00	1	175	-		-			
Work Bench 7' x 3'	69.00	1	69	-		-			
Work Bench 6' x 30"	69.00	-		1	69	-			

PUERTO RICO - CAPITAL EQUIPMENT REQUIREMENTS

REQUIREMENTS BY VOLUME (CIRCUITS/MONTH)

ITEM	UNIT COST	60K		100K		150K		200K	
		# Req.	$	# Req.	$	# Req.	$	# Req.	$
Table Sink	150.00	1	150	-		-			
Hand Press	325.00	1	325*	1	325	-			
Auto Press	11000.00	-		-		1	11000		
Inspect Bench 3' x 4'	150.00	1	150	1	150	-		1	150
Inspection Lights	15.00	1	15	1	15	-		1	15
Resist Strip Machine	3300.00	1	3300	-		-			
Rack 15" x 24'	**	-		-		-			
Rack 15" x 18'	**	-		-		-			
Rack 15" x 14'	**	-		-		-			
Rack 15" x 4'	**	-		-		-			
Rack 15" x 6'	**	-		-		-			
Chair	21.00	1	21	1	21	-		1	21
Shop Cart 1' x 2'	75.00	1	75	1	75	-			
Indicating Viscosity Control System	1210.00	1	1210	1	1210	-			
S.S. Oven	4285.00	1	4285	-		-			
Taping Machine	2700.00	-		1	2700	-			
Rack 15" x 26'	**	-		-		-			
Rack 15" x 12'	**	-		-		-			
Beveler, 48"	3460.00	1	3460*	-		1	3460		
Pexto Foot Shear	555.00	-		1	555	-			
Rack 15" x 4'	**	-		-		-			
Vacuum	420.00	1	420	-		1	420		
Scrubber	7615.00	-		1	7615***	-			
Immersion Tin	5000.00	1	5000	-		-			
Copying Machine	2400.00	1	2400*	-		-			
Desk, Walnut Exec. Type	159.95	3	480	1	160	-		1	160
Conf. Table 3' x 10'	382.00	1	382	-		-			
Sec'y Chair	34.00	1	34	1	34	-			
Swivel Chair	41.00	3	123	1	41	-		1	41

REQUIREMENTS BY VOLUME (CIRCUITS/MONTH)

ITEM	UNIT COST	60K # Req.	60K $	100K # Req.	100K $	150K # Req.	150K $	200K # Req.	200K $
Typewriter	540.00	1	540	1	540	-			
Cassette Transcriber	270.00	1	270	-		-			
Tape Recorder	375.00	1	375	1	375	-			
Adding Machine	314.00	1	314	1	314	-			
File Cabinet 4 dr.	57.00	2	114	2	114	2	114	2	114
Coat Rack	37.50	1	38	1	38	-			
Table 3'x 5'Gen. Purpose	78.00	2	156	2	156	-		2	156
Side Chair	21.00	10	210	3	63	3	63	4	84
Stationary Cabinet	78.00	1	78	-		-			
Book Case	35.00	5	175	2	70	-		2	70
Oven	4285.00	1	4285	-		-			
Dryer	250.00	1	250	-		-			
Sealbrite	(3400.00)	1	3400	-		-			
Griplet Machines	25000.00	1	25000	-		-			
Lab Sink	202.00	1	202	-		-			
Lab Bench Hooded	345.00	1	345	-		-			
Desk	124.00	1	124	-		-			
Swivel Chair	41.00	1	41	-		-			
File Cabinets 4 dr.	57.00	1	57	1	57	-			
Lab Benches, Cabinets and Tables	510.00	4	2040	5	2550	-			
Balance	25.00	1	25	-		-			
Balance Weights	10.00	1	10	-		-			
Oven 0-550°C	350.00	1	350	-		-			
Analytical Balance	925.00	1	925	-		-			
Gyratherm Hot Plate - Stirrer	95.00	1	95	-		-			
pH Meter	400.00	1	400	-		-			
Porosity Tester	675.00	1	675	-		-			
Beta Scope	2500.00	1	2500	-		-			
3D Microscope	450.00	1	450	-		-			

REQUIREMENTS BY VOLUME (CIRCUITS/MONTH)

ITEM	UNIT COST	60K # Req.	60K $	100K # Req.	100K $	150K # Req.	150K $	200K # Req.	200K $
Punch Press	300.00	1	300	-		-			
Safety Shower	65.00	1	65	-		-			
Eyewash	50.00	1	50	-		-			
Lab Stool	32.00	1	32	1	32	-			
Lab Timer	14.00	1	14	2	28	-			
Bunsen or Elec. Equiv.	10.00	1	10	-		-			
Draining Rack	18.50	1	19	-		-			
Laboratory Clamps	200.00	1	200	-		-			
Glassware, etc.	(300.00)	1	300	-		-			
Step Stool	32.00	1	32	1	32	-			
Drill Press	150.00	1	150	-		-			
Belt Sander	79.75	1	80	-		-			
Workers Vise	28.00	1	28	1	28	-			
Hand Saw	549.00	1	549	-		-			
Hammer	10.79	1	11	-		-			
Skill Saw	52.49	1	52	-		-			
Plumbing Equipment	178.95	1	179	-		-			
Threading Tool	135.00	1	135	-		-			
P.V.C. Fittings	200.00	1	200	-		-			
220 Pc Tool Set w/Cab.	271.00	1	271	-		-			
All Hand Tools	300.00	1	300	-		-			
Plastic Welder	39.00	1	39	-		-			
Fusial Welding Kit	180.00	1	180	-		-			
Heavy Shelving 2' x 6'	40.00	1	40	1	40	-			
Fittings, Bolts, etc.	200.00	X	100	X	100	-			
Spare Parts Inventory	3000.00	X	1000	X	1000	-		X	1000
Bench 3' x 5'	80.00	1	80	1	80	-			
Lockers	37.00	1	37	1	37	-			
Stool	32.00	1	32	1	32	-			

PUERTO RICO - CAPITAL EQUIPMENT REQUIREMENTS

REQUIREMENTS BY VOLUME (CIRCUITS/MONTH)

ITEM	UNIT COST	60K # Req.	60K $	100K # Req.	100K $	150K # Req.	150K $	200K # Req.	200K $
Gold Line	115000.00	1	115000*						
Etcher	14000.00	1	14000*	-		-			
Scrubber	7615.00	-		-		-			
Plating Racks	215.00	60	12900						
Resist Stripping Bench	680.00	1	680	-		-			
Air Make Up System	(5000.00)	1	5000						
Air Exhaust System	(5000.00)	1	5000						
Rack 30" x 6'	40.00	1	40	1	40	-			
Work Bench 3' x 6'	69.00	1	69	1	69	-		1	69
Bench 3'x 3'	30.00	1	30	-		1	30		
Work Carts	75.00	1	75	1	75	-		1	75
Etchant Fresh Storage Tanks	5000.00	1	5000	-		-			
Etchant Spent	5000.00	1	5000	-		-			
NaOH	3200.00	1	3200	-		-			
Sulfuric Acid	4300.00	1	4300	-		-			
Water Tempering Unit	2500.00	1	2500			-			
Water Filter	3500.00	1	3500	-		-			
Diacro Press	10000.00	1	10000	-		-			
Die Sets & Tooling	3000.00	8	34000	-	5000	-	5000		
** Indicates all $ here	2000.00	x	1000	x	500	-		x	500
TOTALS			353K		103K		68K		4K

() Indicates Estimate

JAN 12 1971 A. Hanson
Memo Report on P.R.

digital INTEROFFICE MEMORANDUM

SUBJECT: PUERTO RICO

DATE: January 8, 1971

TO: Operations Committee

FROM: D. Knoll

cc: A. Devault
J. Fisher
R. Dill
Central Planning

DEPARTMENT: Mfg. Admin.

Below I've summarized some of the key points brought out in discussions I've had with most of the Operations Committee this week.

1. Someone needs to be responsible for "Puerto Rico." I have felt, now feel and will continue to feel responsible for Puerto Rico. I'm much more involved in the whole situation and have been, than just designing a board shop. Along with Dill and Fisher, I have participated in all the tax discussions with Manny Berman and Lybrand here and in New York, I've talked to various companies who have the same sort of problems we have - Standard Pressed Steel in Philadelphia regarding both Ireland and Puerto Rico, Technicon regarding Ireland, etc. I've been involved for the last year with the various manufacturing changes we're doing to make Puerto Rico more autonomous, such as purchasing, kitting and inspection in and from Puerto Rico. In short, I am and have been responsible for getting more manufacturing into Puerto Rico and making sure that we secure our tax haven.

2. Griplets. There may be some confusion as to how griplets relate to Puerto Rico. Griplets are good; we're going to go ahead and do them in Maynard. Doing them in Maynard will achieve all the cost reductions associated with griplets. Griplets have no direct relationship with Puerto Rico except that when we put a print and etch shop in Puerto Rico we would also do griplets there, and this would allow us to do about 25% of the Puerto Rican board volume which we couldn't do if griplets weren't done there.

3. Subcontracting. At the last meeting I think one of the conclusions was that we should solve the board part of the tax problem by subcontracting boards from Puerto Rico. I didn't make all the facts clear, I guess, but they are as follows:

   A. The bulk of the volume at Puerto Rico is print and etch boards (not PTH/griplets).

B. We must do the bulk of the boards (70+% or so) from Puerto Rico in order to solve the tax problem.

C. Subcontracting out of Puerto Rico doesn't work because we lose when we subcontract non-PTH boards. The annual cost to subcontract print and etch boards is on the order of a $700,000 premium we pay to vendors. Subcontracting is only cheaper for PTH boards which aren't a significant part of Puerto Rico's volume.

D. The transition to getting boards any place but from Maynard either by subcontracting or making in Puerto Rico, has to occur over a period of time and cannot occur immediately, regardless of the cost because we would create instantaneous excess people in Maynard. We need time on the order of 7 to 12 months (about the length of time it takes to build the plant in Puerto Rico) to place people and have an orderly transition. People would only be added to Puerto Rico as people are placed here in Maynard. The timing of this is perfect at this point. If we start now and get Puerto Rico with a production capacity before any great growth pressure occurs in Maynard, everything works out beautifully. The only risk here is that the economy stays at its Quarter 2 level for let's say the next 18 months. In this case we would end up with a facility at Puerto Rico and not be able to add the people to staff it faster than attrition at Maynard.

4. A clearer picture of the investment is show below. This investment covers all board shop investment for the next 2½ years.

	SOURCE	
NEED	Existing, to be Transferred	New
Equipment	$276K	$257K
Leasehold Improvements, Facilities, Utilities	-	165K (down from 216K)
Waste Treatment	-	70K
Contingency	-	50K
Total:	276K	542K
GRAND TOTAL:		$818 (down from 869K)

A. The net investment presented will be reduced by about $70,000 when we get the incentive contract negotiated with the Puerto Rican government.

5. Cost of leasehold improvements. The only investment figure above which is estimated is non-equipment expenditures. The dollars presented last week were based on factoring down Westfield estimates. We are now doing the layouts and doing the detailed engineering. At this point, I am confident we can reduce this figure by $51,000 to $165,000 as shown. I won't know how much more until we get bids.

Another key item is waste treatment where the cost of treating waste will be about $ 70,000 in Puerto Rico. True, we never spent this money in Building 11, but today virtually anywhere we build a plant we must comply with newly tightened and enforced pollution standards.

6. My hang up. To all this, I have one hang up. I'm concerned that we're now hanging all the problems of the world on Puerto Rico, like amendments to a bill going through Congress. These amendments as I see it include the problems of: Should we have a separate module sales force? How do we penetrate the custom module market? How do we penetrate the South American market? ...and even the question of divisionalization or autonomy in DEC's organization. My concern is that if we permit these problems to delay action on what I see as the key issue - to secure our existing module tax haven - we may also "lose the war" against time.

In particular, I am asking for approval to do the following ASAP:

Puerto Rico Module Business

A. Get boards into Puerto Rico
   1. Manufacturing wise
   2. The grant modification
   3. Building expansion

B. The things already going on to increase manufacturing presence (purchasing, kitting, incoming inspection, final test, inventory, etc.)

C. Contracts, etc.
   1. Memos transferring initial know how as a contribution to capital.
   2. Cost sharing contract on intangibles.

D. Assure that we reserve against tax benefits in Puerto Rico short run.

E. Get at least a couple of module salesmen on the Puerto Rico payroll. Develop at least some direct sales from Puerto Rico.

Puerto Rico 8E

A. Get the 8E to Puerto Rico by July

Ireland

A. Get Phase I of the Irish plan going (pick site, move U.K, set up corporation, etc.)

There is nothing in the above which limits our doing the new opportunities things. Without distracting from solving the key tax problem ASAP, I'm interested in keeping the fires burning on taking advantage of the additional opportunites Puerto Rico presents. I would like to approach these opportunities by getting Marketing and Sales people interested with the possibilities of Puerto Rico. I'm as excited as anybody about the broad possibilities of Puerto Rico. Toward this end, Al Devault will be making a proposal.

I think we should proceed now.

jkl

bcc: G. Wood
A. Hanson

memo w/9 attach incl. memos + notes George Wood

digital INTEROFFICE MEMORANDUM

SUBJECT: Puerto Rico Board Facilities Proposal

DATE: December 29, 1970

TO: Central Planning

FROM: D. Knoll Love

DEPARTMENT: Mfg. Admin.

Attached is the backup for the Puerto Rico proposal which is summarized below:

VOLUME

Attachment I — Projected total and Puerto Rico requirements for panels by process for the next 2½ years.

A. Shows PTH/griplet panel volume tripling and print and etch volume doubling.

B. Shows Puerto Rico volume growing 2½ times to 170,000 panels/quarter.

COSTS

Attachment II — PTH operating cost history. Shows the theoretical losses due to making versus buying boards has been $1,695,000 forever.

Attachment III — Comparison of in-house and subcontract panel costs now by operation ($17 inside, $12 outside).

Attachment IV — Print and etch operating cost history. Shows the profit from making print and etch boards forever has been $3,500,000

Attachment V — Griplet versus PTH panel cost comparison. Shows highest griplet cost is slightly lower than best inside PTH cost.

INVESTMENT

Attachment VI — Investment comparison PTH versus etch versus griplet. Shows that half the cost of a board shop is facilities, not equipment, and that

most of the equipment investment is not process dependent. Details book value by operation.

GRIPLETS IN MAYNARD

Attachment VII J. Harrigan's plan for implementing griplets at Maynard.

PUERTO RICO

Attachment VIII G. Wood's proposal for griplet shop in Puerto Rico.

SCHEDULE

Attachment IX With commitments in January 1971, we will have significant presence in Puerto Rico by December 1971.

jkl
Att.

12/22/70

PROJECTED CIRCUIT BOARD REQUIREMENTS

	FY '71			FY '72				FY '73				
olume in Panels (Quan. in ooo's)	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	Total
riplet	--	23	34	51	58	64	69	71	79	87	94	636
TH	38	16	14	9	11	11	12	13	14	15	17	170
ubtotal	38	39	48	60	69	75	81	90	93	102	111	806
yelet	29	38	40	42	42	44	46	48	50	52	52	483
tch	43	57	60	63	63	66	69	72	75	78	78	724
ubtotal	72	95	100	105	105	110	115	120	125	130	130	1,207
otal	110	134	148	165	174	185	196	210	218	232	241	2,013

MODULE ASSEMBLY SCHEDULE* - PUERTO RICO

	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	Total
riplet	--	16	24	36	41	45	48	54	55	61	66	446
TH	27	11	10	6	8	8	8	9	10	11	12	120
yelet	20	27	28	29	29	31	32	34	35	36	36	337
tch	30	40	42	44	44	46	48	50	53	55	55	507
otal	77	94	104	115	122	130	136	147	153	163	169	1,410

*Based on assembling 70% of each type in Puerto Rico

P.T.H. OPERATING COSTS versus SUBCONTRACT

	FY69		FY70		FY71		TOTAL	
A. Cost/Panel	Make	Buy	Make	Buy	Make	Buy	Make	Buy
1. Manufacturing Cost	$21.50		$15.15		$14.65			
2. Purchase Cost		$22.80		$10.80		$ 8.15		
3. Allocation Cost	$ 3.50	$ 3.50	$ 2.00	$ 2.00	$ 2.35	$ 2.35		
4. Inspection & Handling	Above	$ 1.75	Above	$ 1.50	Above	$ 1.50		
5. Total	$25.00	$28.05	$17.15	$14.30	$17.00	$12.00		
B. Panels Manufactured	47.2K	47.2K	222.0K	222.0K	187.0K	187.0K	456.2K	456.2K
C. Annual Cost[1]	$1,180K	$1,320K	$3,810K	$3,180K	$3,180K	$2,240K	$8,170K	$6,740K
D. Savings/(Loss) @ 100% in-house	$ 140K		$(630K)		$(940K		$(1,430K)	
E. Original Investment							$ 474K	
F. Less Amortized Amount							$ (251K)*	
G. Book Value							$ (223K)**	

[1]Based on 100% Make or 100% Buy

* The amortized amount is contained in annual cost figure

**This is book value at end of FY71. Book value today (½FY71) = $265,000

NOTE: The prices above are accurate. The losses are theoretical in that experience says we couldn't have gotten delivery in the volumes required on time.

Attach. II

ATTACH III

digital

INTEROFFICE MEMORANDUM

Reference: My memo to you, PTH Board Costs - In House vs. Subcontract, November 13, 1970.

SUBJECT: P.T.H. BOARD COST COMPARISON BY OPERATION- IN HOUSE VS. SUBCONTRACT

DATE: December 9, 1970

TO: D. Knoll

FROM: Walter Bonin

DEPARTMENT:

OPERATION	IN HOUSE ($/Panel)	DIRECT LABOR SUBCONTRACT ($/Panel)	COMMENTS
Board Prep.	.16	.16	Same Process
Deposition	.44	.28	Vendor has automatic plating
Apply Image	.39	.20	Vendor uses silk screen
Pattern Plate	.24	.14	Vendor uses automatic plating
Strip Ink & Etch	.13	.11	Vendor has conveyorized stripper
Gold Plate	.35	.35	Same process
Final Fab.	.23	.25	We have better tooling
Inspections	1.00	.40	Silk Screen reduces inspection tim
Total	$2.94	$1.89	
		OPERATING SUPPLIES	
Board Prep.	.18	.18	Same material
Deposition	.45	.20	Our solutions expensive/changed oft
Apply Image	.19	.08	Photo resist mat'l is more costly
Pattern Plate	.30	.30	Same material
Strip Ink & Etch	.26	.17	Vendor uses cheap stripper/we will too
Gold Plate	.90	.70	Vendor uses nickel/Gold-1/3 less gold
Final Fab.	.14	.07	Vendor claims less cost-I don't kn why
Total	$2.42	$1.70	
Raw Stock	$1.00	$1.00	Should be the same
Overhead	$2.94	$1.51	DEC rate 100%, vendor 80% due to volume
Reject Material	$5.35	$ .70	DEC yield 65%,[2] vendor yield 90%. Automatic handling, Silk Screen, less inspection increase yields
Manuf. Cost	$14.65	$6.77	
Vendor profit		1.35	@ 20% manuf cost
Alloc. Costs	2.35	2.35	Includes layout, purch. etc.
Handling		1.50	5 panels/hour, D.L. =2.50, OH 200%
*Gross Total	$17.00	12.00	Note: Cost to get panels to stock

*Note 1: Based on In House Production Volume of 15,000 panels/month (Ref memo for details.

Note 2: DEC yield 65% in value, 80% in volume.

DEC 5-1043-C (4-70)

PANEL COST - GRIPLET VS. P.T.H.

	OPERATION	GRIPLET Expected	GRIPLET Highest	P.T.H. Optimum */	P.T.H. Current**	COMMENTS
1.	Labor					
	Bd. Prep.	.16	.16	.16	.16	
	Deposition	---	---	.44	.44	
	Apply Image	.15	.20	.20	.39	Griplet easier to scre
	Pattern Plate	---	---	.24	.24	
	Strip Ink & Etch	.13	.15	.13	.13	
	Gold Plate	.25	.25	.35	.35	No solder strip /gripl
	Final Fab	.11	.13	.23	.23	No reflow / griplet
	Inspections	.25	.40	.50	1.00	No pre-etch Insp./grip
	Tin Plate	.16	.21	---	---	
	Bake	.02	.04	---	---	
	Scrub	.02	.04	---	---	
	Sealbrite	.02	.04	---	---	
	Griplet	.08	.12	---	---	@ 2 mins./Panel
	Crimp	---	---	---	---	Included in griplet ti
	Labor Total	1.35	1.74	2.25	2.94	
2.	Operating Supplies					
	Bd. Prep.	.18	.18	.18	.18	
	Deposition	---	---	.45	.45	
	Apply Image	.08	.08	.08	.19	
	Pattern Plate	---	---	.30	.30	
	Strip Ink & Etch	.17	.17	.17	.26	
	Gold Plate	.85	.85	.90	.90	
	Final Fab.	---	---	.14	.14	No reflow / Griplet
	Inspections	---	---	---	---	
	Tin Plate	.04	.08	---	---	
	Bake	---	---	---	---	
	Scrub	---	---	---	---	
	Sealbrite	.02	.03	---	---	
	Griplet	1.30	1.35	---	---	
	Oper. Supp. Total	2.64	2.74	2.22	2.42	
3.	Raw Stock Total	1.00	1.00	1.00	1.00	
4.	OH Total	.68	1.74	2.25	2.94	50%/100%/100%/100% re
5.	Allocated OH	2.35	2.35	2.35	2.35	
6.	Reject Material	.80	1.68	2.52	5.35	90%/85%/85%/65% respec
7.	Griplet Tooling	.75	.75	---	---	
	Total	9.57	12.00	12.59	17.00	

GRIPLET TOOLING

Initial Tooling (1 set) = $400
ECO's (2½ @ $50 each) = $125
Total(for life of bd.type) $525/type @ 20 types/mo.=$10,500
$10,500 ÷ 14000 Panels/Mo.=$.75/Panel

*Using Silk Screen for Applying Image and increasing $ yield from 65% to 85
**Using Photo Resist for Applying Image

ATTACHMENT

INVESTMENT COMPARISON - PTH VS. ETCH VS. GRIPLET

Facility Investment (original purchase/book value)

	PTH		ETCH		Griplet (59K Panels/Mo. @ P.R.)						
					New	On Hand		Transfer		Total	
	Orig.	Book	Orig.	Book		Orig.	Book	Orig.	Book	Orig.	Book
Equipment ($K)											
Punch	$2	$1	$2	$1	$5	$5	$4	$5	$3	$15	$12
Drill	96	60	146	91	43	38	30	73	60	154	133
Sand	2	1	2	1	1	5	4			6	5
Scrub	-		20	6		8	6			8	6
Wet Hone	19*	12									
Deposition	13*	3									
Screen	5	4	6	5	29					29	29
Photo Resist	48*	30									
Pattern Plate	31*	20									
Solder Plate	16*	15									
Etch	17	6	16	9		14	12			14	12
Strip Solder	1*										
Gold Plate	25	18	8	6	16	115	115			131	131
Shear & Bevel	8	5	4	3	5	4	3			9	8
Reflow	13*	10									
Tin Plate			8*	2	6			7	6	13*	12
Blank	8	6			10					10	10
SealBrite					8					8*	8
Griplet					71					71*	71
Equipment Total	$304	$191	$212	$124	$194	$189	$174	$85	$69	$468	$437
Other ($K)											
Electrical	$28	$12			$35					$35	$35
Plumbing	26	11			35					35	35
Waste Treatment	33	14			60					60	60
Ventilation	26	12			10					10	10
Leasehold	31	11			146					146	146
Misc. Tanks	6	4			24					24	24
Water Treatment	9	4									
Miscellaneous	11	6	9		35	4	3			39	38
Contingencies					50					50	50
Pipe In Water					5					5	5
Other Total	$170	$74	$9		$396	4	3	0	0	404	403
Gross Total ($ K)	$474	$265	$221	$124	$594	$193	$177	$85	$69	$572	$839

*Denotes investment unique to that process. For PTH the unique investment was:

Orig.	Book
$141K	$90K

digital INTEROFFICE MEMORANDUM

SUBJECT: PLAN FOR CONVERSION OF PTH BOARD TYPES TO GRIPLETS

DATE: December 29, 1970

TO: Central Planning

FROM: Jack Harrigan

CC: Ron Cajolet
Mike McGraw
Chip Huber
John LaBate
Bill Plante
George Wood
Fred Bowers
Dick Price

DEPARTMENT: Board Fabrication

SUMMARY

Here is the plan for conversion of the biggest part of PTH production to griplets. Board Fabrication is already tooling up on a conversion schedule which could have 70% of PTH volume being made with griplets by March 1, 1971.

The biggest problem at the moment is lack of Engineering approval for the conversion. In spite of this, tooling up will continue and conversion can follow Engineering approval immediately.

Fewer people are needed to make the same number of circuits using griplets than to make PTH circuits. Therefore, DEC could gain great flexibility in board capacity if we convert to griplets before the next rise in board requirements happens.

TOOLING

Two board types, W967 and H851, are now being run in production using griplets to meet all requirements for those types. Tooling, to provide for conversion of most other PTH types to griplets, will be available according to the following schedule:

DATE	ACCUMULATIVE NO. OF TYPES CONVERTED TO GRIPLETS	% OF AVERAGE MONTHLY PTH VOLUME REQUIREMENT	RESULTING POSSIBLE DAILY GRIP-LET PROD.	DAILY PANEL PROD.
1-15-71	10	21%	320 ckts/da	85 panels
1-22-71	25	43%	660 "	170 "
1-29-71	40	52%	800 "	213 "
2-5-71	55	58%	900 "	243 "
2-12-71	70	62%	960 "	278 "
2-19-71	85	65%	1010 "	294 "
2-26-71	100	67%	1050 "	303 "
3-26-71	110	73%	1125 "	330 "
4-23-71	120	81%	1255 "	367 "

No tooling for conversion of 8E boards to griplets will be ordered or scheduled until 8E board designs have stabilized--probably around June, 1971.

ECO's

ECO's and Tapes for the conversion of most PTH Types to griplets are being generated at a rate better than 25 Types/week. ECO's are being funneled through Ron Cajolet for "missionary work" in getting Engineering approval.

Without Engineering approval, this whole program falls apart.

PEOPLE

Once Engineering approval has been obtained, and actual conversion of production to griplets begun, PTH capacity can be replaced by equivalent griplet capacity using fewer people. This relationship is shown in the following charts:

NET CHANGE IN PEOPLE

	Griplet Prod.- 500 ckts/day PTH to Griplet (est. 1-25-71)			Griplet Prod.- 1000 ckts/day PTH to Griplet (est. 2-22-71)			Griplet Prod.- 1500 ckts/day PTH to Griplet (est. 5-1-71)		
	401*	402	Net Surplus	401*	402	Net Surplus	401*	402	Net Surplus
Supervisors	0	0	0	0	0	0	0	0	0
Group Lead.	0	0	0	0	0	0	-2	+1	1
Maint.	0	0	0	0	0	1	-1	+1	0
Clerk	0	0	0	0	0	0	0	0	0
AQL	0	0	0	0	0	0	0	0	0
Male I	-3	0	3	-6	0	6	-9	+1	8
Female I	-7	+5	2	-7	+7	0	-13	+8	5
Male II	0	0	0	-5	0	5	-6	0	6
Female II	0	0	0	0	0	0	0	0	0
Male III	-2	+2	0	-6	+4	2	-10	+6	4
Female III	-1	0	1	-6	+3	3	-7	+3	4
			6 people			16 people			28 peop

*As PTH Types are converted to griplets, the remaining PTH panel ratio and yields reflect more difficult board types, ie. @2000/day PTH Mix = 2.0, Yield =85%; @1500/day PTH Mix = 1.8, Yield = 82%; @1000/day PTH Mix = 1.5, Yield = 78%; @500/day PTH Mix =1.3, Yield = 75%

It is expected that increased production requirements by the end of February will absorb the surplus of people griplets create. Otherwise, we will be faced with a people placement problem.

RAW MATERIAL

A. Copper Clad Laminate

Conversion to griplets will mean that we use up raw stocks of 1 oz. copper clad laminate at a much slower rate. At the new slower usage rate we will be left with:

Raw Stock			
14-05974 (Flip Chip Size)	102K Panels in House worth $83.6K	112K Panels on open order worth $90K	Total equals 8 yrs. usage @ 2K/month
14-09251 (Memory Stack Size)	50.5K Panels in House worth $47K	58K Panels on open order worth $53K	Total equals 17 yrs. usage @ 500/month

Discussions with Henry Crouse are scheduled for the week of January 4, 1971, to consider alternatives for markedly reducing these inventories. One alternative is to use 1 oz. copper for all print and etch (griplet) boards instead of 2 oz. copper.

B. Griplets

A blanket order for 50 million griplets is being placed. (approx. 6 months supply at 1500 ckts/day) This reduces the cost/thousand from the present price of $3.52/M to $2.11/M--a savings of about $5K/month at start up rates.

Simultaneously $16.5K is being spent to obtain back up dies to produce griplets in the event that the sole supplier is unable to supply them. Delivery will be 12-16 weeks.

Berg capacity to supply griplets is now reportedly 60-100 million griplets/year, which is insufficient for DEC needs at proposed levels of griplet production. The new blanket order will do much to change that capacity. Furthermore, Jack Harrigan will be coordinating carefully to insure that Berg has adequate capacity for DEC needs.

RESERVE OF PTH BOARDS

When the first two additional board types are converted to griplet production, the Board Fabrication Department will have two weeks requirements additional on the shelves as finished PTH boards, as insurance.

MASS INSERTION EQUIPMENT

DEC now has 1 mass insertion loader (X machine) plus 1 Press, plus 1 Flat Press.

An additional loader and press will be arriving 1-15-71. This will provide mass insertion capacity up to 400 panels per day (1 shift).

WHERE DOES THIS TAKE US?

After conversion of 1500 PTH ckts/day to griplet, PTH will be left with 80 people and capacity of 500 ckts/day. Equipment in the department will be capable of producing an additional 3500-4500 ckts/day depending on the mix, merely with the addition and training of people.

SCHEDULE OF CONVERSION BY BOARD TYPE

(See Attachment)

JACK

SCHEDULE OF CONVERSION BY BOARD TYPE

Listed below is the sequence in which tooling is being obtained for conversion:

MODULE TYPE	MONTHLY VOLUME	PRODUCT LINE
M510	700	9,15,T
M102	320	8,10,T
M633	450	8,10,T
M101	550	8,15,T
M161	550	8,9,11,12,15
M623	900	8,12,T
M622	900	9,15
M611	720	12,15
M103	830	8,12,15,T
M226	450	15
M133	950	12,15
G222	800	15
M205	800	8,15
G100	500	15
M135	500	12,15
M139	420	12,15
K207	350	14
W102	350	10
M632	300	9,15
M624	270	12,T
M223	270	10
M100	270	8,10,T
M500	250	9,11,15,T
M516	240	9,11,15
G225	240	11
M169	230	12,T
M202	210	8,T
M311	210	9,15
G223	200	15
M621	200	15
M707	200	8,10,12,15
M706	190	8,12,15
M129	180	12,15
M240	180	15
M304	170	10,11,12
M910	170	15
R220	170	8,10
M104	160	9,15,T
M507	160	8
M729	160	11

MODULE TYPE	MONTHLY VOLUME	PRODUCT LINE
M930	160	11
W122	160	11
M224	150	11
M242	150	15
M909	150	15
G084	140	10
M783	130	11
M127	125	11,12,15
M212	120	8,10,12,15
M902	120	15
M746	120	14
K220	110	
M233	110	10
M705	110	11,12,15
M907	110	8
M221	100	12
M710	100	8,10,11,12,15
M715	100	8,11,12
M222	100	12
M228	95	8,11,15
M164	80	15
M724	80	11,12
M725	80	11
M726	80	11
M727	80	11
M728	80	11
M820	80	11
M821	80	11
M822	80	11
M823	80	11
M824	80	11
M825	80	11
M911	75	9,15
M211	70	15,T
M734	65	12
M794	60	11
M107	55	8,12
M163	55	8,10,11,15
M217	55	12
M218	50	15
M232	50	14
M312	50	9,15
M719	50	12
M735	50	12
M786	50	11
M787	50	11

MODULE TYPE	MONTHLY VOLUME	PRODUCT LINE
M227	50	15
M162	45	8,T
M708	45	8
M208	45	
A131	40	12
A615	40	12
M106	40	11,14
M143	40	10
M220	40	8
M503	40	12
M508	40	8
M517	40	8
M781	40	11
M796	40	11
M798	40	11
G226	1000	11
M606	210	8,9,11,15
M109	160	11
M307	110	8,10,12,15,T
M060	75	10
M750	70	8
G822	60	15
G823	55	15
G924	50	14
G102	1000	11
M105	400	11
M782	390	11
G103	240	11
M780	190	11
G829	110	9,15
M927	65	11
G825	55	15
A801	40	8,12
M795	40	11

digital INTEROFFICE MEMORANDUM

SUBJECT: PROPOSAL TO BUILD A CIRCUIT BOARD FAB SHOP IN PUERTO RICO

DATE: December 22, 1970

TO: Central Planning

FROM: G. Wood

DEPARTMENT: Facility Planning

I propose that we install a print and etch and Griplet Board Facility in the existing San German building. Key figures are below:

PRODUCTION LEVELS (CIRCUITS/MONTH)-SINGLE SHIFT
----ALL NUMBERS ARE TOTALS---

Circuits/Month Panels/Month	60K 17.5K (Present P.R. Level)	100K 29K	150K 44K	200K 59K
Space Req'd (Sq. Ft.)	17K	17K	22K	25K
Dollars Req'd				
A. Leasehold	$160K	174K	$216K	$216K
B. Capital Equipment	409K	523K	590K	594K
C. Less Eqpt. on Hand	-193K	-278K*	-278K	-278K
D. Contingencies	+50K	+50K	+50K	+50K
E. Pipe In Water	---	+5K	+5K	+5K
F. Total	$426K	$474K	$583K	$587K
People Req'd				
Male	4	4**	6	10***
Female	43	79	114	147
Total	47	83	120	157
Timing				
1st Prod. 20K/Mon.	6 mos.	--	--	--
All Boards	8 mos. (Standing Start)	6 mos. (Running Start)	6 mos. (Running Start)	3 mos. (Running Start)
Water & Waste Treatment				
Req'd (GPM)	85 GPM	130 GPM	165 GPM	165 GP
Available	Yes	Wells nearby Sewage System Expansion Req'd		

* Based on an estimated $85K of equipment being freed up in Maynard.
**After 60K level-drilling and plating go on multiple shift.
***After 150K level screening, etching, scrubbing also go to multiple shifts

Long Lead Items - Waste Treatment Facility is judged to be longest lead item. Six months is a best estimate.

Risks and Limitation

1. Site has water for 60K production level only. Additional water located in wells 700 ft. away.

2. Sewer authority has capacity to take the waste for the 60K production level. Sewage plant expansion is now out for bids. D.E.C. negotiations should include a commitment to insure sewer capacity.

3. Griplet related equipment has the capacity to do 16K panels/month on a one shift basis. If necessary, well over 50% of the total board requirement could be made with griplets by running some of the machinery for more than one shift.

Attachments:

A. Leasehold Investment

B. Capital Equipment Requirements

G. Wood
T. Bader
12/22/70

LEASEHOLD INVESTMENT $ - PUERTO RICO

ITEM	60K	100K	150K
Plumbing	30K		5K
HVAC	20K		15K
Electrical	30K		5K
Structural (Concrete, Gratings, Sumps, & Supports)	30K		5K
Interior (Carpentry & Petitions)	10K	5K	5K
Clean Room	30K	0K	0K
Steam Boiler Room			
Transportation	2K	2K	2K
Installation (Rigging)	8K	7K	5K
Total Additions By Year	160K	14K	42K
Grand Total			$216K

* Items on hand in Westfield

REQUIREMENTS BY VOLUME (CIRCUITS/MONTH)

ITEM	UNIT COST	60K		100K		150K		200K	
		# Req.	$	# Req.	$	# Req.	$	# Req.	$
Lift Truck	(2000.00)	1	2000	-		-			
Rack 8' x 30"	*	-		-		-			
Rack 8' x 15"	*	-		-		-			
Rack 12' x 15"	*	-		-		-			
File Cabinets 4 dr.	57.00	1	57	1	57	1	57	1	57
Standard Desk	80.00	1	80	-		-			
Table, 2' x 4'	40.00	1	40	-		-			
22 Ton Press	4600.00	1	4600*	1	4600	1	4600		
Die Rack, Heavy	100.00	1	100	-		-			
Die Lift	250.00	1	250*	-		-			
Conveyor 18 x 10'	*	-		-		-			
Conveyor 18 x 15'	*	-		-		-			
Stool	32.00	1	32	-		-			
Heavy Shelving 4' x 20' x 8" high	200.00	1	200	-		-			
Rack 2' x 20' Heavy	100.00	-		1	100	-		1	100
Foot Shear	775.00	1	775*	-		-			
Table 2' x 5'	78.00	1	78	-		-			
Rack 15 x 8'	*	-		-		-			
Conveyor 18 x 15'	*	-		-		-			
Conveyor 18 x 5'	*	-		-		-			
Sanding Deburring Mach.	4762.00	1	4763*	-		-			
Torit Cyclone	1234.00	1	1234	-		-			
N.C. Drill	38455.00	3	115365*	2	76910	2	76910		
Vacuum	420.00	2	840	1	420	1	420	1	420
Table 3' x 3'	30.00	1	30	-		-			
Bench 2' x 3'	30.00	-		1	30	1	30		
Bench 2' x 4'	30.00	-		-		1	30	1	30
Table 8' x 3'	50.00	1	50	1	50	-			
Table 6' x 3' Gen. Purpose	78.00	-		-		-			
Hi Speed Drill Press	220.00	1	220	-		-			
Tape Rack	30.00	1	30	1	30	-		1	30
Rack 4' x 15"	*	-		-		-			

PUERTO RICO - CAPITAL EQUIPMENT REQUIREMENTS

Requirements by Volume (Circuits/Month)

ITEM	UNIT COST	60K		100K		150K		200K	
		# Req	$	# Req.	$	# Req.	$	# Req.	$
Rack 10' x 15"	*	-		-		-			
Pick Press	300.00	1	300	-		-			
Rack 15" x 20'	*	-		-		-			
Bench 3' x 4'	30.00	1	30	-		1	30		
Inspection Bench	150.00	3	450	3	450	3	450	3	450
Inspection Lights	15.00	3	45	3	45	3	45	3	45
Soldering Irons	5.00	3	15	3	15	3	15	3	15
Bench Lights (mag)	25.00	3	75	3	75	3	75	3	75
Rack 15" x 18'	*	-		-		-			
Rack 15" x 4'	*	-		-		-			
Chair	21.00	3	63	3	63	3	63	3	63
Sommaca Scrubber	7615.00	1	7615*	-		-			
Screen Wash	400.00	1	400	-		-			
Vacuum Frame	250.00	1	250	-		-			
Hydro-Lite	(200.00)	1	200	-		-			
Tri-Sink	200.00	1	200	-		-			
Film Cabinet 2' x 3'	180.00	1	180	-		-			
File Cabinet 4 dr.	57.00	1	57	1	57	-		1	57
Table 3' x 7'	50.00	1	50	-		-			
Work Bench 2' x 7'	69.00	1	69	-		-			
Screen Jig - Hi Vacuum Pump	2344.00	1	2344	-		-			
Film File 4' x 3'	200.00	1	200	-		-			
Vacuum Frame	250.00	1	250	-		-			
Work Bench 3' x 6'	69.00	1	69	-		-			
Bench 3' x 2½'	30.00	-		1	30	-			
Punch	150.00	1	150	-		-			
Gen. Purpose Light Table	78.00	1	78	-		-			
File Cabinet 4 dr.	57.00	1	57	-		-			
Viewer	80.00	1	80	-		-			
Dryer	175.00	1	175	-		-			
Work Bench 7' x 3'	69.00	1	69	-		-			
Work Bench 6' x 30"	69.00	-		1	69	-			

REQUIREMENTS BY VOLUME (CIRCUITS/MONTH)

ITEM	UNIT COST	60K		100K		150K		200K	
		# Req.	$	# Req.	$	# Req.	$	# Req.	$
Table Sink	150.00	1	150	-		-			
Hand Press	325.00	1	325*	1	325	-			
Auto Press	11000.00	-		-		1	11000		
Inspect Bench 3' x 4'	150.00	1	150	1	150	-		1	150
Inspection Lights	15.00	1	15	1	15	-		1	15
Resist Strip Machine	3300.00	1	3300	-		-			
Rack 15" x 24'	*	-		-		-			
Rack 15" x 18'	*	-		-		-			
Rack 15" x 14'	*	-		-		-			
Rack 15" x 4'	*	-		-		-			
Rack 15" x 6'	*	-		-		-			
Chair	21.00	1	21	1	21	-		1	21
Shop Cart 1' x 2'	75.00	1	75	1	75	-			
Indicating Viscosity Control System	1210.00	1	1210	1	1210	-			
S.S. Oven	4285.00	1	4285	-		-			
Taping Machine	2700.00	-		1	2700	-			
Rack 15" x 26'	*	-		-		-			
Rack 15" x 12'	*	-		-		-			
Beveler, 48"	3460.00	1	3460*	-		1	3460		
Pexto Foot Shear	555.00	-		1	555	-			
Rack 15" x 4'	*	-		-		-			
Vacuum	420.00	1	420	-		1	420		
Scrubber	7615.00	-		1	7615	-			
Immersion Tin	5000.00	1	5000	-		-			
Copying Machine	2400.00	1	2400*	-		-			
Desk, Walnut Exec. Type	159.95	3	480	1	160	-		1	160
Conf. Table 3' x 10'	382.00	1	382	-		-			
Sec'y Chair	34.00	1	34	1	34	-			
Swivel Chair	41.00	3	123	1	41	-		1	41

REQUIREMENTS BY VOLUME (CIRCUITS/MONTH)

ITEM	UNIT COST	60K # Req.	60K $	100K # Req.	100K $	150K # Req.	150K $	200K # Req.	200K $
Typewriter	540.00	1	540	1	540	-			
Cassette Transcriber	270.00	1	270	-		-			
Tape Recorder	375.00	1	375	1	375	-			
Adding Machine	314.00	1	314	1	314	-			
File Cabinet 4 dr.	57.00	2	114	2	114	2	114	2	114
Coat Rack	37.50	1	38	1	38	-			
Table 3'x 5'Gen. Purpose	78.00	2	156	2	156	-		2	156
Side Chair	21.00	10	210	3	63	3	63	4	84
Stationary Cabinet	78.00	1	78	-		-			
Book Case	35.00	5	175	2	70	-		2	70
Oven	4285.00	1	4285	-		-			
Dryer	250.00	1	250	-		-			
Sealbrite	(3400.00)	1	3400	-		-			
Griplet Machines	25000.00	1	25000	-		-			
Lab Sink	202.00	1	202	-		-			
Lab Bench Hooded	345.00	1	345	-		-			
Desk	124.00	1	124	-		-			
Swivel Chair	41.00	1	41	-		-			
File Cabinets 4 dr.	57.00	1	57	1	57	-			
Lab Benches, Cabinets and Tables	510.00	4	2040	5	2550	-			
Balance	25.00	1	25	-		-			
Balance Weights	10.00	1	10	-		-			
Oven 0-550°C	350.00	1	350	-		-			
Analytical Balance	925.00	1	925	-		-			
Gyratherm Hot Plate - Stirrer	95.00	1	95	-		-			
pH Meter	400.00	1	400	-		-			
Porosity Tester	675.00	1	675	-		-			
Beta Scope	2500.00	1	2500	-		-			
3D Microscope	450.00	1	450	-		-			

REQUIREMENTS BY VOLUME (CIRCUITS/MONTH)

ITEM	UNIT COST	60K # Req.	60K $	100K # Req.	100K $	150K # Req.	150K $	200K # Req.	200K $
Punch Press	300.00	1	300	-		-			
Safety Shower	65.00	1	65	-		-			
Eyewash	50.00	1	50	-		-			
Lab Stool	32.00	1	32	1	32	-			
Lab Timer	14.00	1	14	2	28	-			
Bunsen or Elec. Equiv.	10.00	1	10	-		-			
Draining Rack	18.50	1	19	-		-			
Laboratory Clamps	200.00	1	200	-		-			
Glassware, etc.	(300.00)	1	300	-		-			
Step Stool	32.00	1	32	1	32	-			
Drill Press	150.00	1	150	-		-			
Belt Sander	79.75	1	80	-		-			
Workers Vise	28.00	1	28	1	28	-			
Hand Saw	549.00	1	549	-		-			
Hammer	10.79	1	11	-		-			
Skill Saw	52.49	1	52	-		-			
Plumbing Equipment	178.95	1	179	-		-			
Threading Tool	135.00	1	135	-		-			
P.V.C. Fittings	200.00	1	200	-		-			
220 Pc Tool Set w/Cab.	271.00	1	271	-		-			
All Hand Tools	300.00	1	300	-		-			
Plastic Welder	39.00	1	39	-		-			
Fusial Welding Kit	180.00	1	180	-		-			
Heavy Shelving 2' x 6'	40.00	1	40	1	40	-			
Fittings, Bolts, etc.	200.00	X	100	X	100	-			
Spare Parts Inventory	3000.00	X	1000	X	1000	-		X	1000
Bench 3' x 5'	80.00	1	80	1	80	-			
Lockers	37.00	1	37	1	37	-			
Stool	32.00	1	32	1	32	-			

REQUIREMENTS BY VOLUME (CIRCUITS/MONTH)

ITEM	UNIT COST	60K # Req.	60K $	100K # Req.	100K $	150K # Req.	150K $	200K # Req.	200K $
Gold Line	115000.00	1	115000*	1	115000	1	115000		
Etcher	14000.00	1	14000*	-		-			
Scrubber	7615.00	-		-		-			
Plating Racks	215.00	60	12900	60	12900	60	12900		
Resist Stripping Bench	680.00	1	680	-		-			
Air Make Up System	(5000.00)	1	5000	1	5000	1	5000		
Air Exhaust System	(5000.00)	1	5000	1	5000	1	5000		
Rack 30" x 6'	40.00	1	40	1	40	-			
Work Bench 3' x 6',	69.00	1	69	1	69	-		1	69
Bench 3'x 3'	30.00	1	30	-		1	30		
Work Carts	75.00	1	75	1	75	-		1	75
Etchant Fresh Storage Tanks	5000.00	1	5000	-		-			
Etchant Spent	5000.00	1	5000	-		-			
NaOH	3200.00	1	3200	-		-			
Sulfuric Acid	4300.00	1	4300	-		-			
Water Tempering Unit	2500.00	1	2500	1	2500	-			
Water Filter	3500.00	1	3500	-		-			
Waste Treatment System consists of 23 tanks, pumps, mixers, controls, heaters, a floculating pit and a sludge filter bed.	70000.00	x	50000	x	10000	-			
Diacro Press	10000.00	1	10000	-		-			
Die Sets & Tooling	3000.00	8	34000	-	5000	-	5000		
* Indicates all $ here	2000.00	x	1000	x	500	-		x	500
TOTALS			486K		258K		241K		4K

() Indicates Estimate

KEY EVENT SCHEDULE

Operations Committee Approval	January 4
P.O. for Waste Treatment	January 11
Final Acceptance of Griplets by Product Lines	January 15
Place Equipment Purchase Orders	January 20
Negotiations in Puerto Rico to Modify Grant	by February 28
Griplets Implemented at Maynard	March 1
Puerto Rico Shop Ready for Production	July 15
Half of Puerto Rico's Requirements Done in Puerto Rico (dependent on rate of placing Maynard people)	October
All of Puerto Rico's Requirements Done in Puerto Rico	March 1972

AN Greg B
RC TBM.

Puerto Rico Mtg. 1/14 - Opattle 7/11/71

Develop. Arch
Elec
Mech
HVAC
Plumbing

Existing layout to Lou Bouchard (sp) ASAP
to make up existing and back to Maynard
ASAP.

Gold Plate -
Wall to Ceiling to contain fumes in case of exhaust failure

Plate Prep.
Temp & RH control

Conveyor - Oven (Silk Screen)
Temperature control

Drill Room
Temperature control.

Utility available at need
(1) Elec
(2) Lights
(3) Water
(4) Air
(5) Heat?
(6) A/C.

Partitions - use DEC standard

Camp Dresser & Mc Kee to Engineer STP.

Air Make up Unit at Westminster to Westminster
Possible old P.R A/C units to be used at PR PTH & Silk Screen.

Toilet Requirements? Greg B to clear Al's file.

Possible use Leominster benches in PR for inspection

What are chemicals stored

P.M. clear P.R. units
charge PR x 91.

Need big mechanical contractor in P.R

134 Send A/C to P.R to Lou Bouchard for D.P/RH - contact F. Kabell for help

Puerto Rico

Environmental	Rms. 3000SF @ $25	1. 75K
Electrical		20
Partitions		10K
Mech.		
Air Make-up & Exh (Rigging		4.5
Plumbing (Rig		15
Waste Treatment.		10
		175K

200
15
0

170
15
850
170
2550
3

(2317)

Drill Room (10' high wall, 9' high drop ceiling + lighting in area

* Drill Room HVAC at $30/ft² add 900 ft² = $27,000
Vacuum system $6000

* $30/ft² includes 10' partition, ceiling, electrical, A/C inside, lighting, sprinkler and compressed air. Est. 5 Ton A/C required.
Estimate vacuum cleaning system 10 H.P.
Estimate 4 drills inc. controls 10 HP.

$33,000

Conveyor - Oven Area 1440 ft² at $50/ft² for partition, ceiling, lighting, sprinkler, A/C. $72,000

---

52 x 16 = 832 ft² at $50/ft² - ceiling, partition, A/C $41,600

Lab Area

40 ft partition x $6/ft	240
Exhaust system	400
Plumbing	1500
Bench installation	2000
Electrical	500
	$4000

7' high Wire Partition
440' x 2.20 ~$1000

Central Dust Collection (3 stations) $3000 inst.

Plating area exhaust - fan, pvc duct (5000-6 ex) $17,000 inst.

Make Up Unit - with pvc ducting - corrosion coating - fact. noise supp 17,000 inst

Gold Plate

HVAC

20,000 CFM

① Gold Plate Room 16,000 CFM Exh. —
Exhaust ~~8000~~ CFM on Auto. Gold Machine
" ~~15,000~~ CFM on Tin Plate Line (80% steam)
~~3000~~ CFM on E/L

② Partition
(a) Carry partition to ceiling (17')?
(b) 10' high partition and drop ceiling lighting

1. Electrical Power.
   (a) Lighting
   (b) Equipment
   (c) Air Conditioning

2. HVAC
   (a) A.C.
   (b) Dust Collection
   (c) Exhaust Air.

3. Partitions

4. Benches.

5. Waste Treatment

6. Structural corrosion protection in plating area.

Power Distribution

TELEPHONE MEMO

FOR Pete

DATE 1/13/70 TIME 1:45 p

While you were out, you were called

by Walter Gudenman X2830

Please return call		Will call again	
Wants to see you		Please rush	

Mon + Tues (Dec. 1969 29th + 30th) Nov.

A/C ~~His~~ man was in here 31st Wednesday

TAKEN BY Mary

DEC 5-1009

Puerto Rico

memo re Boilers

digital INTEROFFICE MEMORANDUM

SUBJECT:

DATE: January 12, 1970

TO: Pete Mackey

FROM: Phil Markell

LOCATION:

If you have not already done so I am hopeful that you will be able to get to me immediately upon receipt of this memorandum. The information we discussed last Thursday in regard to the leakage which occurred as a result of our "consultants" inefficiency.

Once you have furnished me with the facts and figures I will draft a letter for your approval.

PM:crs

On Dec 29 a valve malfunctioned and caused flooding of a gas boiler used to supply steam to clean room humidifiers. The same problem occured on Dec 30 when the Blowen Rep was called in to investigate. He installed a pressure reducing water regulating valve

and cleaned strainers - The
system has operated satisfactory
to this date - On Jan - Thurs -
they came in and made repairs
to insulation caused by the
two days the system flooded.
All this work has been
done at no charge to DEC, The
system is working as per the
mfg. specs at the present time.

DEC memos

digital INTEROFFICE MEMORANDUM

DATE: October 21, 1969

SUBJECT: Puerto Rico - Pridco

TO: Jan Woulter FROM: Phil Markell -DEC

Just a reminder that you were going to remind Phil Wood that we need a copy of the Pridco letter granting us permission to occupy the new addition prior to completion. Ed wishes to respond to this letter so that there is no question later as to the meaning of our early occupancy.

PM:crs

2561.

APR 13 1973

Puerto Rico

memo

A. Hanson

XR Construction

CHECK LIST - NEW P.T.H. FACILITY

DATE: March 27, 1973
FROM: George Wood

NO:	PROBLEM : ITEM : PROPOSED SOLUTION	PERSON RESPONSIBLE	COMPLETION DATE	"NEW" DATE	STATUS : COMMENTS
1	Site borings in Aguadilla	Sidel/Garcia	Complete		
2	Decision to build a PTH facility in Aguadilla	Wood	2/5/73		Plan is to go to Puerto Rico. San German is also being considered - both sites being carried. Should know about water in San German by 4/1/73.
3	File an environmental impact statement	Krasnow/Guzman	4/1/73		Ramon is on contract - Data being collected. First draft by 4/1. Scheduled for 4/4 meeting.
4	Support data for E.Q.B. a) General process outline General process treatment General effluent characteristics Company Annual Report	Wood/Pucci Lordi	Complete		
	b) Sink hole dye test	Krasnow/Guzman	2/15/73		E.Q.B. to review by 3/6/73 Reviewed but no decision Geological report being written-no date.

5	Make Application for licence to operate in Puerto Rico. Al Sidel & Bill Krasnow	Sidel/Krasnow	3/1/73		Applications rec'd will file prior to 4/1/73 In- process submitted by 4/15/73
6	Own or have permission to clear land in Aguadilla	Wood/Schwartz	3/1/73		Facilities Planning has set a must date of 4/1/73. Ed Schwartz to verify if this is possible Gov. given O.K.
7	Develop building criteria	Garcia/Krasnow	No date		Size the building - Final Plan Whats going in - Location on the property. In process
8	Run a water draw down test on the "8" line in Aguadilla	Krasnow/Guzman	3/1/73		To be done week of 3/5/73 Status unknown Answer by 4/3/73
9	Act on Ramon Guzman's proposal to represent us in all filings for permits, etc.	Bill Krasnow	Complete		

10	Formulate plans and obtain approvals: Initial work $50K Commitment on long lead items $250K Project approval ($$$)	Wood Wood Wood	Complete 4/1/73	 4/3/73	
11	Secure additional information from Garcia/ Rexach and select a design-build team	Sidel	Complete		
12	Hire a waste treatment consultant	Wood/Lordi	Complete		
13	Issue a checklist on site consideration factors and proceed to re-evaluate the Hudson site	Beebe/Sidel	Complete		Boston Survey Corp. hired to check out Hudson -new target date for completion is now 3/16/73 Copy to G. Wood by:
14	Proceed with Hudson site plan up to filing papers and committing large sums of money	Krasnow/Schwartz	On hold pending Krasnow/Sidel critical date decision	3/16/73	Sidel, Beebe, Krasnow have committed to ut in a file all plans, papers, applications, P.O.'s etc, required to proceed so as to expedite the project when approved.

15	Run a geological study Topographical map Boundary survey for Aguadilla site	Sidel/Garcia	complete		
16	Time - events schedule from facilities planning	Sidel	First pass 2/23/73	First pass complete	No date set for final version
17	Preparation of block layout for zoning.	Wood	4/15/73		

Puerto Rico

memo
XR Land

digital INTEROFFICE MEMORANDUM

TO: Al Hanson
cc: Dave Knoll
Bill Hanson
Bill Krasnow

DEC 21 '72

DATE: December 20, 1972

FROM: Ed Schwartz

DEPT: Legal

SUBJ: Aguadilla Site

As usual, PRIDCO did not meet its December 15th deadline of informing me of the fact that the land in Aguadilla will be ours. They came as close as I could reasonably expect, knowing PRIDCO. I received a call from the President of PRIDCO on December 19th to inform me of the fact that the papers have been prepared for the "taking" of approximately 150 acres in Aguadilla and requesting to sell 50 of these acres to DEC.

The papers have not been signed by the Governor because they want to wait for the new Governor who will take office on January 10, 1973. In addition, the President of PRIDCO doesn't even know if he is going to be in office after the 5th of January. He expects a new Administrator of the Economic Development Administration to be appointed and he is uncertain whether this new Administrator will ask him to stay on as President of PRIDCO.

I have been assured by President Arends that if he does not continue in office, he will hold this matter in high priority and set up a meeting between himself, the new President, the Administrator and myself so that I will have the opportunity to be sure that the "new Administration" acts expeditiously on this matter.

I now must wait until January 10th before I can take my next step.

/sam

Puerto Rico

memos
XR Land
XR Leasing

Ed Schwartz
Al Hanson
cc: Pete Kaufmann
Ray Carlson

June 1, 1972

Dave Knoll

Manufacturing
1-4

PUERTO RICO LAND

I got a call from Ray Carlson in Puerto Rico. Below for your information is an outline of the deal he'll be coming back ready to propose on the Aquadilla site.

1. Must be a lease - (an option has adverse tax consequences on Lessor);
2. Willing to lease for 5 years with option to purchase as follows:

	Lease Cost	Purchase Price $/querdo
1st yr.	$5K	8,500 (beginning of year)
2nd yr.	6K	9,000
3rd yr.	7K	9,500
4th yr.	8K	10,000
5th yr.	9K	10,500
	$34K	11,000 (end of 5 year period)

How do you review

Rent paid is applicable to sales price;
We have right to do borings, etc.
They pay taxes;
Contingent on zoning, sewer, power, water.

If we get out due to one of the above contingencies, we forfeit half of the rent paid.

lml

CC
Dave Knoll
Pete Kaufmann,
file
This is the best alternate we have to offer - If you decide to go ahead I want to verify the utilities etc.
Dan Hanson

Puerto Rico

memo
XR Leasing
XR Land

Ed Schwartz
Al Hanson
cc: Pete Kaufmann
Ray Carlson

June 1, 1972

Dave Knoll

Manufacturing
1-4

PUERTO RICO LAND

I got a call from Ray Carlson in Puerto Rico. Below for your information is an outline of the deal he'll be coming back ready to propose on the Aquadilla site.

1. Must be a lease - (an option has adverse tax consequences on Lessor);
2. Willing to lease for 5 years with option to purchase as follows:

	Lease Cost	Purchase Price $/guerdo
1st yr.	$5K	8,500 (beginning of year)
2nd yr.	6K	9,000
3rd yr.	7K	9,500
4th yr.	8K	10,000
5th yr.	9K	10,500
	$34K	11,000 (end of 5 year period)

Rent paid is applicable to sales price;
We have right to do borings, etc.
They pay taxes;
Contingent on zoning, sewer, power, water.

If we get out due to one of the above contingencies, we forfeit half of the rent paid.

lml

CC
Dave Knoll
Pete Kaufmann,
file
This is the best alternate we have to offer - If you decide to go ahead I want to verify the utilities etc.
Al Hanson

5/71

AL 9

Puerto Rico
Messages

G. Wood memo
re: Construction

Q1

HELLO PR IS PETE MACKEY THERE

Via

WAIT GEORGE WOOD IS GOING TO TRANSMIT A MESSAGE

111111122222QWQWQWQW

Q2

IS JAIME THERE
TODAY

Q3

HI DID THE CONSTRUCTION WORK START

PLS ANSWER

Q.4. HOW ON EARTH DO YOU EXPECT TO FINISH ON TIME ??

ations Inc.
NY Phone Serv: Telegr. 797-3311 / Mangr.-7522 / Infor.-7550 / Telex-7590

2300 4th p.k

X MMMVVVVV
JUST AMOMENT ILL SEE IF HES STIKL

Ans. 1

IM SORRY BUT I THINK HE LEFT FOR HOME ALREADY.

Ans. 2

YES YUST A MOMENT
SIM HERE IS JAIME
GA PLS
VM
NO SAM Q WALLACE WAS SUPPOSED TOCOMMENCEM
QVDELIVERING MATERIALS TODAY BUT THEY DID NOT

Ans 3.

JPON DORIS ELECTRICAL CAME TO CHECK SOMO PLACS WITH PETE
MCKEY
WE ARE EX PECTING TO HAVE SAM P WALLACE TO COMMENCE WORKING NEXT COMMING
MONDAY
PETE WENT TO SEE FULTO ABOUT SOME SUB CONTRACTING ELECTRICAL
ON THE NEW BUILDING
GA PLS