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LOOKING GLASS, INC. VOLUME IV. INDUSTRIAL GLASS DIVISION. OPERA--ETC(U)
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1 OF 2

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Operational Manual
Volume IV

David L. DeVries

Looking Glass, Inc. Industrial Glass Division

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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Looking Glass is a simulation of a glass manufacturing corporation. There are twenty positions, ranging across three divisions and four levels (plant manager, director, vice-president and president). The divisions face different environments, ranging from volatile to stable. Looking Glass is typical--the organizational type, structure and environments are common. All problems contained in the simulation are based on actual events.

This volume contains all memos relating to the Industrial Glass Division.

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LOOKING GLASS, INC.

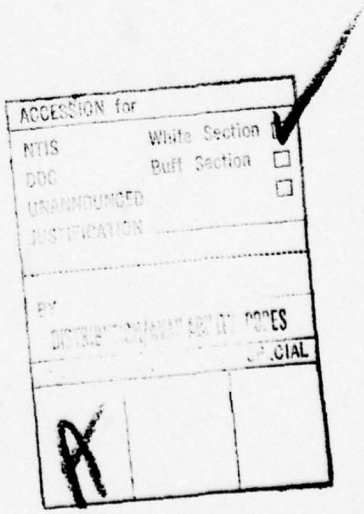
INDUSTRIAL GLASS DIVISION

DAVID L. DeVRIES

OPERATIONAL MANUAL VOLUME IV

This research was sponsored by the Organizational Effectiveness Research Program, Office of Naval Research (Code 452), under contract No. N00014-76-C-0870; NR 170-825; and by the Center for Creative Leadership.

The Center for Creative Leadership is a nonprofit, educational institution founded by the Smith Richardson Foundation. The Center's primary goal is to translate the knowledge of the behavioral sciences into useful applications for leaders. Toward this goal, the Center conducts and reviews relevant research and uses these findings in a variety of programs.



DESCRIPTION OF VOLUMES

Looking Glass is a simulation of a glass manufacturing corporation. There are twenty positions, ranging across three divisions and four levels (plant manager, director, vice-president and president). The divisions face different environments, ranging from volatile to stable. Looking Glass is, in a word, typical--the organizational type, structure and environments are common. All problems contained in the simulation are based on actual events.

Volume I of the simulation materials is divided into four sections. Section I describes the development of Looking Glass. Included are the chronology of what occurred from original idea to final pretest run and a summary of assumptions and biases related to constructing a realistic management simulation. The next section discusses research issues such as the experimental modes built into the design, possible manipulations, limitations of the simulation, measurement strategies, and preliminary hypotheses. The third section outlines training uses of the simulation, including one detailed example of a training program. The final section explains the nuts and bolts of running the simulation. This section and the appendices that follow enables users to refer to staffing and administrative necessities.

Volumes II through IV contain the simulation materials. Volume II contains all memos relating to the Advanced Products Division, and also includes organization-wide corporate memos, and all memos to the President. Volume III contains all memos relating to the Commercial Glass Division, and Volume IV, all memos concerning the Industrial Glass Division.

Subsequent volumes will contain standardized responses to information requested by participants (Volume V) and a complete listing and analysis of all problems participants face (Volume VI).

NOTICE

The material contained herein relates to a simulation of managerial performance developed by the Center for Creative Leadership pursuant to a contract with the Office of Naval Research. The context of the simulation is a fictitious corporation in the American glass industry. Any points of similarity between the simulation and an existing glass company are purely coincidental.

The simulation is an intensive exercise, and users are cautioned that a risk to participants exists. The Center for Creative Leadership assumes no responsibility whatsoever for any injury that may result from the use of the simulation by any other organization or individual.

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OPERATIONAL MANUAL VOLUME IV

VOLUME IV

INDUSTRIAL GLASS DIVISION

I. To All Roles From Corporate

CORP- 1 to CORP-3

List of Abbreviations

HISTORY OF LOOKING GLASS

Looking Glass, Inc., was founded fifty years ago by A. J. Looking. Begun as a manufacturer of light bulb casings, Looking Glass has expanded into a major corporation with $200 million in sales and over 4,000 employees.

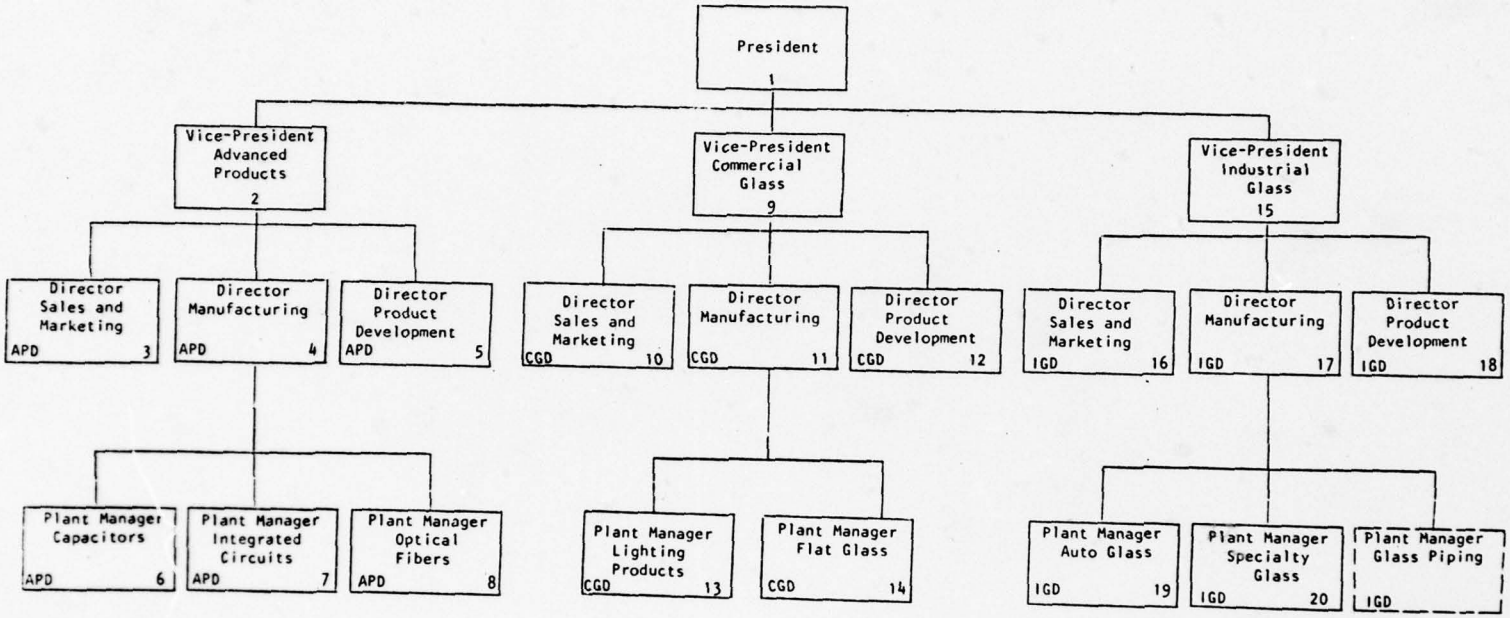
The Commercial Glass Division produces light bulb casings, tubes for fluorescent lights, and a variety of flat glass products.

The Industrial Glass Division produces automotive glass, specialty glass (for airplanes and assorted industrial uses), and glass piping and glass piping insulation (for use in industrial settings).

The Advanced Products Division uses glass in such high technology products as capacitors, integrated circuits, and optical fibers (for use in telecommunications).

All Looking Glass products are sold to manufacturers who make finished products from these components or to independent distributors.

LOOKING GLASS, INC.



LOOKING GLASS, INC.

POSITION ABBREVIATIONS

ABBREVIATION	TITLE AND DIVISION
ADVANCED PRODUCTS DIVISION	
VP, APD	Vice-President
DIR-MFG, APD	Director of Manufacturing
DIR-S&M, APD	Director of Sales and Marketing
DIR-PD, APD	Director of Product Development
PM-CAPACITORS	Plant Manager, Capacitors
PM-INT CIRCUITS	Plant Manager, Integrated Circuits
PM-OPT FIBERS	Plant Manager, Optical Fibers
COMMERCIAL GLASS DIVISION	
VP, CGD	Vice-President
DIR-MFG, CGD	Director of Manufacturing
DIR-S&M, CGD	Director of Sales and Marketing
DIR-PD, CGD	Director of Product Development
PM-FLAT	Plant Manager, Flat Glass
PM-LIGHTING	Plant Manager, Lighting Products
INDUSTRIAL GLASS DIVISION	
VP, IGD	Vice-President
DIR-MFG, IGD	Director of Manufacturing
DIR-S&M, IGD	Director of Sales and Marketing
DIR-PD, IGD	Director of Product Development
PM-AUTO	Plant Manager, Auto Glass
PM-SPECIALTY	Plant Manager, Specialty Glass

LOOKING GLASS
Corporate Offices

To: All Executives of Looking Glass, Inc.

From: Corporate Controller

Re: Corporate Profits (In Thousands)

Copies to:

	NET SALES		NET PROFITS	
	LATEST YEAR	PREVIOUS YEAR	LATEST YEAR	PREVIOUS YEAR
Commercial	$72,000	$67,867	$3,300	$3,106
Advanced	39,400	35,100	3,600	2,700
Industrial	87,000	73,600	4,600	3,018
TOTAL	$198,400	$176,567	$11,500	$8,824

NET INCOME AS A % OF SALES

	LATEST YEAR	PREVIOUS YEAR
Commercial	4.6%	4.6%
Advanced	9.1%	7.7%
Industrial	5.3%	4.1%
TOTAL	5.8%	5.0%

CURRENT FINANCIAL RATIOS

	Commercial	Advanced	Industrial
Debt to Equity	37.6	58.2	32.6
Return on Equity	10.4	12.1	7.8
Return on Assets	5.6	7.5	5.4
Receivables Turnover	7.1	7.0	8.5
Cost of Goods Sold As a % of Sales	74.8%	70.9%	73.9%
R & D As a % of Sales	1.8%	5.1%	5.3%
Operating Profit Margin As a % of Sales	12.1%	18.3%	13.9%

DEFINITIONS OF FINANCIAL RATIOS

DEBT/EQUITY RATIO: The proportion of capital supplied by creditors.

RETURN/EQUITY RATIO: Percentage return (net income) on stockholder's investment.

RETURN ON ASSETS: Net income divided by total assets. Percentage return on the book value of the resources of the firm.

RECEIVABLES TURNOVER: Measure of how quickly customers pay their accounts and of current credit policies. Net Sales divided by Accounts Receivable.

COST OF GOODS SOLD AS A % OF SALES: Measure of how efficiently goods are manufactured and sold.

R & D AS A % OF SALES: Investment in research on future products.

OPERATING PROFIT MARGIN: $\frac{\text{Net Income}}{\text{Net Sales}}$ before taxes and interest are paid.

VOLUME IV

INDUSTRIAL GLASS DIVISION

II. Across Division Memos

A. To IGD From the President

PRES- 1 to PRES- 4
PRES- 9
PRES-14
PRES- 5
PRES-23

B. To IGD From APD

APD- 99
APD-100

C. To IGD From CGD

CGD-64
CGD-65

LOOKING GLASS

Office of the President

To: All Executives of Looking Glass

From: President

Re: State of the Corporation Address

Copies to:

I will make a State of the Corporation address to all executives at 3:00 today, to be followed by a question and answer period.

LOOKING GLASS
Office of the President

To: Those Listed

From: President

Re: Coordinated Sales Program

Copies to:

DIR-S&M, APD
DIR-S&M, CGD
DIR-S&M, IGD
VP, APD
VP, CGD
VP, IGD

The last meeting of the Management Committee addressed the increasing complexity of Looking Glass sales operations. It was the feeling of the Committee that the Sales and Marketing directors should get together to:

- identify common problems;
- coordinate solutions to these problems;
- plan for future problems.

The Committee took no position on specific actions, and no such decisions are contemplated at this level. It is up to you to decide what, if anything, should be done. Please keep my office informed.

LOOKING GLASS
Office of the President

To: Those Listed

From: President

Re: Security

Copies to:

VP, APD
VP, CGD
VP, IGD

We've been stung in the past by other glass manufacturers pirating our executives and key technical people. Because we pay relatively high salaries and otherwise take care of our own, we've been more fortunate than some other companies. Still, our competitive edge depends on our ability to maintain confidentiality on our key processes.

Some companies require their executives and technical people to sign an agreement of confidentiality as well as on not taking a job with a competitor. I'd like to get your ideas on this or other strategies that might be effective at Looking Glass.

LOOKING GLASS

Office of the President

To: Those Listed

From: President

Re: Low Expansion Furnace Linings

Copies to:

VP, APD
VP, CGD
VP, IGD

I've discussed this with each of you, and each of you thinks the others should do it. New England Furnace Company wants 200 tons of low expansion cellular glass for furnace linings, and we are going to give it to them. I don't care which plant produces it--you decide among yourselves and let me know. A summary of the specifications is attached.

We can't expect to make anything on this, and we might even go into the red some. But if we do a good job, we stand to gain substantial future orders from them.

CELLULAR GLASS FOR FURNACE LININGS

(SUMMARY)

TECHNOLOGY:

To make cellular glass furnace linings, borosilicate glass is ground and mixed with a foaming agent. Borosilicate glass is made as follows:

Sand + Soda Ash + Boric Acid + Cullet + Arsenic +

Antimony heated to 1625°C (2957°F)

DELIVERY DATES:

50 tons:	6 weeks from today
100 tons:	8 weeks from today
50 tons:	10 weeks from today

DELIVERY LOCATION:

Willimantic, Connecticut

LOOKING GLASS

Office of the President

To: Those Listed

From: President

Re: Looking Foundation

Copies to:

VP, APD
VP, CGD
VP, IGD

Our proposal to form a foundation has been approved by the Board of Directors. Funding will depend upon the specific purpose for which the foundation exists. Let's meet soon to discuss that purpose.

LOOKING GLASS
Office of the President

To: Those Listed

From: President

Re: Purchase

Copies to:

VP, APD
VP, CGD
VP, IGD

Over the past year, we have discussed terms with Cascade to purchase their operations in Battle Creek, Michigan, for $42 million. The facility would maintain its present product mix of lime glass bottles, decorative bottles, and high quality lead crystal decanters and goblets.

Meet with me at 2:00 to discuss how we should allocate our resources. We obviously cannot follow through on all proposed investment opportunities, so should we choose this one or others? I think it's time to make a decision. We've discussed this long enough.

LOOKING GLASS

Office of the President

To: Vice-President, IGD

From: President

Re: R & D on Underwater Glass

Copies to:

I want a status report on the R & D efforts I requested two years ago from your Product Development people regarding the development of a high-stress underwater glass. I want to share our progress with Admiral Billings during my visit to Washington next week. This project has got to be a winner. It could keep us on the forefront in glass technology, and the potential for enhancing our reputation is extensive.

I'm surprised we don't have prototypes already available. I think PD has taken too long--the R & D problems can't be that complex! As I understand it, the glass is a minor variation of that which we developed for the spaceshuttle vehicles.

LOOKING GLASS

Office of the President

To: Vice-President, IGD

From: President

Re: Plant Manager, Specialty Glass

Copies to:

It's becoming more obvious how important an immediate replacement for the Glass Piping plant manager position is to Looking Glass. In looking over the latest salary information memo for IGD, I see that the Plant Manager of Specialty Glass has been in that post for 5 years. You know that I advocate frequent rotation of our line managers.

Have you thought of rotating the Specialty Glass plant manager into the Glass Piping position? Stop by sometime today and let's discuss this issue.

LOOKING GLASS

Advanced Products Division

To: Director of Sales and Marketing, APD

From: Plant Manager, Integrated Circuits

Re: Losing Money

Copies to:

PM-SPECIALTY

We are losing money on the sheet glass we manufacture for the Industrial Glass Division. The glass we provide for spacecraft and microwave ovens is high silica and the price of silica is up 20% over last year. They paid $40,000 last month and our cost of goods sold was $38,000. The 5% margin left isn't covering our G & A. They're going to have to go outside.

LOOKING GLASS

Advanced Products Division

To: Those Listed

From: Director of Product Development, APD

Re: Research Staff

Copies to:

DIR-PD, CGD
DIR-PD, IGD

It's no secret that staff are trying to switch from your division to mine. The reasons I've heard are:

- APD is where the action is;
- APD has the highest profit margin--let's go where we'll be rewarded.

Needless to say, this is causing hard feelings. We're being called pirates; you're being accused of damaging people's careers. Surely we can work out something to stop this. We're all in this thing together; these rumors are hurting us all individually and Looking Glass as an organization.

LOOKING GLASS

Commercial Glass Division

To: Listed Below

From: Director of Manufacturing, CGD

Re: Internal Task Force on Plant Managers Performance

Copies to:

PM-LIGHTING
PM-CAPACITORS
PM-AUTO

PRESIDENT
DIR-MFG, APD
DIR-MFG, IGD

Corporate has long been concerned about how to measure plant manager performance. At the last corporate planning meeting, the issue was raised again. It was decided to form a corporate-wide task force to investigate: 1) what a plant manager does, and 2) how to evaluate plant manager performance.

It was a general feeling that the place to start was with the plant managers themselves. The President authorized the formation of a task force consisting of a plant manager from each of the divisions. Appointed to this task force are:

Plant Manager, Lighting Products (chair)
Plant Manager, Capacitors
Plant Manager, Auto Glass

The chairperson is responsible for getting this task force started and for reporting its progress to me. I'd like for you to get together sometime during your visit today to lay out a plan of attack. Through the Plant Manager, Lighting Products, let me know basically what you need to do to answer the questions:

1) What resources will be required?
2) How long you think it will take?

For your information, a copy of our current appraisal form is attached.

LOOKING GLASS

CORPORATE OFFICES

NAME OF EMPLOYEE_____ DATE_____

JOB TITLE_____

IMPORTANT--Be sure you consider only one characteristic at a time, regardless of how good or poor he/she may be in the others. It is essential that every question be answered; if more space is needed to answer any item, please write on plain paper and attach to this form. Your overall rating on each factor should be shown by code symbol in the box to the right. Mark "O" for Outstanding; "E" for Excellent; "SP" for Satisfactory Plus; "S" for Satisfactory; "SM" for Satisfactory Minus; "U" for Unsatisfactory.

A. QUALITY OF WORK — Insert Rating Code ☐
Comments:

B. QUANTITY OF WORK — Insert Rating Code ☐
Comments:

C. ABILITY TO PLAN AND UNDERSTAND WORK — Insert Rating Code ☐
Comments:

D. ABILITY TO GET ALONG WITH OTHERS — Insert Rating Code ☐
Comments:

E. OVERALL PERFORMANCE RATING (ALL FACTORS) — Insert Rating Code ☐
Comments:

If performance of any of above is below expectations, what should be done to bring about improvements?

PREPARED BY_____ DATE_____

REVIEWED AND
APPROVED BY_____ DATE_____
(Your immediate supervisor)

RECORD OF INTERVIEW:
This report was discussed with the employee on_____
(Date)

Signed_____
(Employee)

CGD-64B

LOOKING GLASS

Commercial Glass Division

To: Those Listed

From: Plant Manager, Flat Glass

Re: Internal Task Force on Heat and People

Copies to:

VP, CGD
PM-SPECIALTY
PM-OPT FIBERS
PM-INT CIRCUITS

As we are all aware, the furnaces in our plants produce enormous heat (the working area around them averages 95°). Each of us has had problems with heat prostration, etc., among our people. In spite of the best ventilation systems we can devise, it's always going to be hot. We don't have a general policy regarding the rights of the people who work around these furnaces; each plant seems to handle the problem differently, some allowing unlimited breaks while others just play it by ear.

I have been asked by the Vice-President of the Commercial Glass Division to chair a task force to develop some policy guidelines. Task force members, including myself, are:

Plant Manager, Flat Glass (chairperson)
Plant Manager, Specialty Glass
Plant Manager, Optical Fibers
Plant Manager, Integrated Circuits

Jobs around the furnaces are tough, high turn-over positions. We should develop some notions about breaks, special dispensation, water, or other possible means for reducing the unpleasantness of the work.

Can we get together later today to start working on the problem? At a minimum, we should lay out what we need to do to develop a policy. Attached are some figures that should get us started.

G-5
G-2

CGD-65A
(APD-105)

FURNACE HEAT

TURNOVER

Overall hourly turnover: 12.3%

Turnover of furnace workers: 40.1%

TRAINING REQUIRED FOR NEW FURNACE WORKERS

16 hours classroom

24 hours on-line

VOLUME IV

INDUSTRIAL GLASS DIVISION

III. To IGD From Corporate

CORP- 8
CORP-49 to CORP-71

LOOKING GLASS
Corporate Offices

To: President

From: Corporate Controller

Re: Consolidated Balance Sheet

Copies to:

VP, APD
VP, CGD
VP, IGD

LOOKING GLASS

CONSOLIDATED BALANCE SHEET

(In Thousands)

ASSETS	LATEST YEAR	PREVIOUS YEAR
CASH	$16,402	$14,762
RECEIVABLES	29,910	26,919
INVENTORIES	16,501	17,370
PLANT & EQUIPMENT	86,835	75,544
OTHER ASSETS	43,320	39,076
TOTAL ASSETS	$192,968	$173,671
LIABILITIES		
CURRENT LIABILITIES	$18,332	$19,104
LONG-TERM LIABILITIES	57,890	48,101
CAPITAL STOCK	26,051	26,051
RETAINED EARNINGS	90,695	80,415
TOTAL LIABILITIES	$192,968	$173,671

LOOKING GLASS
Corporate Offices

To: President

From: Director of Public Relations

Re: Press Releases

Copies to:

VP, IGD
DIR-MFG, IGD
DIR-S&M, IGD
DIR-PD, IGD
PM-AUTO
PM-SPECIALTY

Attached are the press releases describing Auto Glass, Specialty Glass, and Glass Piping. Do you have any suggestions for changes?

AUTO GLASS

Products: Looking Glass has, for the past 45 years, been a major producer of car and truck windows and windshields. Those 45 years have seen major improvements in safety and convenience characteristics. Looking Glass has developed a thin, penetration resistant windshield, one that shatters into fine fragments which adhere to the windshield on impact. These improvements have resulted in a substantial decrease in head injuries for front-seat occupants involved in accidents. Radio antennas, often subject to vandalism, can now be embedded in the windshield through the use of two layers of glass. Auto windows have also been improved through the development of tinted glass, which substantially reduces glare from the sun.

Manufacturing Process: The basic component is lime glass, which consists of silicone dioxide (74%), sodium oxide (14%), calcium oxide (9%), and other minor ingredients (3%). To produce one ton of lime glass the following raw materials are required: sand (1400 lbs.), soda ash (450 lbs.), limestone (350 lbs.), and other ingredients, including broken glass (cullet) (180 lbs.). The ingredients are combined in a furnace in which they melt under an intense heat of approximately 3000°F.

While glass can be made using several different processes, auto glass at Looking Glass is made by the "float" technique. This is a recently developed way of forming glass which is much more efficient and creates glass with greater strength. The float process begins with the molten (liquid) glass in the furnace. Molten glass flows onto a bed of molten tin in an area with a controlled atmosphere of nitrogen gas, thereby creating a very smooth glass surface. The glass solidifies at a higher temperature than the tin and is drawn off for further cooling. Because no rollers touch the molten glass, the surface remains clear and undisturbed. The glass is then cut and either packed and shipped (if fabrication is done elsewhere) or sent on for a final finishing process, in which the glass might be chemically treated, bent, and/or cut into the precise shape required.

Simple adjustments allow glass made by the float technique to vary in width and thickness. Addition of chemicals to the raw ingredients, lengthened cooling periods, or various coatings applied to the glass after forming can affect its strength, light and heat transmittance qualities, and color.

Customers: Auto Glass products are sold to major automobile and truck manufacturers in one of two forms: (1) blanks--the flat glass plates which are sent to the auto manufacturer which then fabricates the flat glass into usable window panes, or (2) finished windows and windshields ready to be installed in the vehicle.

SPECIALTY GLASS

Products: The Industrial Glass Division also produces glass products which require unusual thermal, mechanical, and optical properties. These include oven windows (for both conventional and microwave), aircraft windows and windshields (for military, private, and commercial aircraft), and spacecraft windows. Each of these types of glass must meet unusual and severe demands on their strength. Looking Glass has played an integral role in the U.S. space program by providing spacecraft windows since the early 1960's. Looking Glass projects in this area have placed it in the vanguard of glass technology.

Manufacturing Process: In this plant each product involves a separate production process. For example, spacecraft windows are made from a special glass called aluminosilicate. To make this type of glass, aluminum oxide is added to a high silica glass under extreme heat. What results is a glass that is most resistant to heat, that reflects light, and that resists electricity. Making such glass is expensive because the raw materials are rare, and the production process elaborate.

The making of aircraft windows involves quite a different process. Basic borosilicate glass is coated with several layers of tin oxide. This creates a glass which conducts electricity well. The better the conductor the glass becomes, the more easily it defrosts.

Oven windows are designed to be highly heat resistant. The production begins with borosilicate glass. The finishing process involves coating the glass with magnesium fluoride and zinc sulphide.

Customers: The products of Specialty Glass are shipped to major industrial manufacturers (such as aircraft manufacturers) ready to be installed. All fabrication is conducted in the plant, requiring considerable effort to meet exact specifications of the customer. The Specialty Glass plant prides itself on a track record of meeting even the most stringent specifications of customers.

GLASS PIPING

Products: This plant makes both piping and piping insulation used in industrial settings. The piping is used in chemical plants, dairies, and wineries to transfer liquids which may be corrosive, or require a constant environment, for which glass piping is uniquely suited. Other products made in this plant are used for insulating piping and for general industrial piping insulation. In the transfer of many liquids, it is critical that the temperature not vary widely; glass insulation can maintain this constant environment. This product line began in earnest about 15 years ago and has shown continuing steady growth.

Manufacturing Process: The manufacture of glass piping begins with molten borosilicate glass. A stream of molten glass is drawn rapidly over and around a cylinder, which emits a continuous stream of air, creating a hollow glass stream. The glass is then chemically strengthened by placing it in a hot bath of molten salt; this makes the glass up to ten times stronger. The hot salt bath tightens up the chemical composition of the glass surface so that it better resists pressures. Borosilicate glass resists heat, corrosion, and thermal shock.

Glass piping insulation is made from foam or cellular glass. A disguised form of glass, cellular glass looks bubbly and flexible; actually it is remarkably strong and rigid. Cellular glass is made by grinding up borosilicate glass and mixing it with a chemical foaming agent in a furnace, which acts as yeast in bread dough. When the mixture is heated and the ground glass melts, the foaming agent puffs up. The glass expands because of the air bubbles, cools, and hardens. It is almost as light as cork, is noncombustible, and is not affected by humidity.

Customers: The glass piping products are sold exclusively to original equipment manufacturers who incorporate the tubing into liquid processing machinery. The insulation materials are also sold to these manufacturers. The division also directly markets the insulation products to major industrial contractors who install glass piping.

PLANT LOCATIONS

Auto Glass:	Findlay, Ohio (city of 40,000; 40 miles south of Toledo)
Specialty Glass:	Towson, Maryland (suburb of Baltimore)
Glass Piping:	Lynchburg, Virginia (city of 60,000; 90 miles east of Richmond)

LOOKING GLASS
Corporate Offices

To: President

From: Director of Public Relations

Re: Industrial Glass Division Description

Copies to:

VP, IGD
DIR-MFG, IGD
DIR-PD, IGD
DIR-S&M, IGD
PM-AUTO
PM-SPECIALTY

The corporate communications group has prepared this summary of your division. Any problems with it?

LOOKING GLASS, INC.

INDUSTRIAL GLASS DIVISION

The Industrial Glass Division is a producer of a wide range of industrial products. While the division has been and remains a leader in supplying auto glass, it has, in recent years, profitably expanded the technology of glassmaking to meet new and exciting challenges, including the development of glass able to withstand the pressures of space travel. While the Division's profit picture fell slightly during and immediately after the recession three years ago, it quickly returned to new heights.

LOOKING GLASS
Corporate Offices

To: Listed Below

From: Corporate Personnel

Re: Job Descriptions

Copies to:

VP, IGD
DIR-MFG, IGD
DIR-PD, IGD
DIR-S&M, IGD
PM-AUTO
PM-SPECIALTY

Here, for your information, are the job descriptions of all division executives.

VICE-PRESIDENT, IGD

JOB DESCRIPTION

You are a Vice-President of Looking Glass, responsible for all activities in the Industrial Glass Division. You report directly to the President of Looking Glass, as do your two peers, the Vice-Presidents in charge of the Advanced Products and the Commercial Glass Divisions.

Reporting to you are three directors in your division: Sales and Marketing, Manufacturing, and Product Development.

Your division has three plants: one manufactures auto glass (windows and windshields), the second produces specialty glass (oven, aircraft, and spacecraft windows), and the third makes both glass piping (used for wineries, chemical industry, and dairies) and insulation for such piping. Each site is led by a plant manager. All plants are geographically distant from your office at corporate headquarters. Plant managers make regular visits (once every two months) to headquarters, and today two of the three plant managers (from Auto Glass and Specialty Glass) are at headquarters. The position of plant manager for the Glass Piping plant is temporarily vacant. The Director of Manufacturing, in addition to other duties, is currently responsible for the management of the Glass Piping plant.

Your division is directly responsible for all sales, marketing, manufacturing, and product development connected with the products made in your three plants.

You and the President have final say in matters of executive hiring and firing, new products, plants, and research developments in your division. While you do not concern yourself with the day-to-day activities of the directors who report to you, you have operational responsibility for all financial, legal, and government matters which affect your division.

You are a member of the Management Committee. Committee membership consists of the President and the three division Vice-Presidents. The committee is responsible for all major corporate policy and operating decisions.

DIRECTOR OF MANUFACTURING, IGD

JOB DESCRIPTION

You are the Director of Manufacturing for the Industrial Glass Division of Looking Glass. You report directly to the Vice-President of the Industrial Glass Division. The Director of Sales and Marketing and the Director of Product Development are your divisional peers and also report to the Vice-President.

You are responsible for the effective running of three plants: (1) Auto Glass (producing auto windows and windshields), (2) Specialty Glass (manufacturing oven, aircraft, and spacecraft windows), and (3) Glass Piping (producing both industrial piping and glass insulation for such piping). Each plant is led by a plant manager. Because all plants are located at geographical sites distant from the corporate offices, the plant managers visit headquarters once every two months. Today two of the three plant managers (Auto and Specialty) are at headquarters and expect to meet with you. The Glass Piping plant manager position is temporarily vacant. In the interim you have been assigned the additional responsibility of managing the Glass Piping plant. The Plant Superintendent is reporting directly to you.

You have responsibility for implementing all corporate decisions regarding the manufacture of products within the Industrial Glass Division. The Director of Sales and Marketing is responsible for assessing and developing markets for the product lines manufactured in your division. The Director of Product Development is responsible for designing and modifying products for your division. As a director you are responsible for all financial, legal, governmental, and personnel matters within the manufacturing part of the division.

DIRECTOR OF PRODUCT DEVELOPMENT, IGD

JOB DESCRIPTION

You are the Director of Product Development for the Industrial Glass Division of Looking Glass. You report directly to the Vice-President of the Industrial Glass Division. Also reporting to the Vice-President are the Directors of Sales and Marketing and of Manufacturing.

You have overall responsibility for the design, modification, and improvement of machines and technologies used for producing glass products in your division. You are also responsible for all phases of product development, including analyzing the feasibility of new products and making design changes on existing products.

All manufacturing responsibilities fall to the Director of Manufacturing, and all sales and marketing functions are the responsibility of the Director of Sales and Marketing.

As a director you are responsible for all financial, legal, governmental, and personnel matters within the Product Development group.

Your division has three plants: (1) Auto Glass (auto windows and windshields), (2) Specialty Glass (oven, aircraft, and spacecraft windows), and (3) Glass Piping (industrial piping and glass piping insulation). The plant managers from the Auto and Specialty Glass plants are at headquarters today for their bi-monthly reports. The plant manager position for Glass Piping is temporarily vacant. The Director of Manufacturing, in addition to other duties, is directly responsible for managing the Glass Piping plant.

DIRECTOR OF SALES AND MARKETING, IGD

JOB DESCRIPTION

You are the Director of Sales and Marketing for the Industrial Glass Division of Looking Glass. You report directly to the Vice-President of the Industrial Glass Division. Also reporting to the Vice-President are the Directors of Manufacturing and Product Development.

You have overall responsibility for both the sales and marketing functions of the division. These include maintaining and generating new sales for the existing product lines within the division, assessing market needs and potentials for both existing and new products, and working directly with the Manufacturing and Product Development groups to insure a desirable divisional profit picture.

All production responsibilities fall to the Director of Manufacturing. All design or modification of equipment, technology, or products is the responsibility of the Director of Product Development.

As a director you are also responsible for all financial, legal, governmental, and personnel matters within your unit of the division.

Your division has three plants: (1) Auto Glass (windows and windshields), (2) Specialty Glass (oven, aircraft, and spacecraft windows), and (3) Glass Piping (industrial piping and insulation for glass piping). The plant managers from the Auto and Specialty Glass plants are at headquarters today for their bi-monthly reports. The position of Glass Piping plant manager is temporarily vacant. The Director of Manufacturing, in addition to other responsibilities, is managing the Glass Piping plant.

PLANT MANAGER, AUTO GLASS

JOB DESCRIPTION

You are the Plant Manager of a large plant which produces windows and windshields used in automobiles. For some customers you make only large, flat glass sheets which are then sent to fabricators who bind and cut the glass to meet the requirements for specific auto lines. For other customers, you manufacture the completed product.

Yours is one of three plants in the Industrial Glass Division. The other two plants are Specialty Glass (produces oven, aircraft, and spacecraft windows), and Glass Piping (manufactures industrial piping for use by the chemical industry, wineries, and dairies, and associated insulation products).

You and the other two plant managers report to the Director of Manufacturing. Every two months you travel to corporate headquarters to meet with your superior to take care of any business you may have with divisional or corporate officers. Today you are at headquarters and should plan to brief the Director of Manufacturing on the status of your plant. You are being joined by the plant manager of the Specialty Glass plant. The position of manager of the Glass Piping plant is temporarily vacant. The Director of Manufacturing, in addition to other duties, is responsible for managing the Glass Piping plant in the interim.

All sales for products made in your plant are the responsibility of the Director of Sales and Marketing. All design or modification of equipment, technology, or products is the responsibility of the Director of Product Development.

PLANT MANAGER, SPECIALTY GLASS

JOB DESCRIPTION

You are the Manager of a plant which produces a range of specialty glass products. These include windows in conventional and microwave ovens, windshields and windows for aircraft (commercial, private, and military), and windows for spacecraft.

Yours is one of three plants in the Industrial Glass Division. The other plants are Auto Glass (produces components for and completed units of auto windows and windshields) and Glass Piping (manufactures piping for use by the chemical industry, wineries, and dairies, and associated insulation products).

You and the other two managers report directly to the Director of Manufacturing. Every two months you travel to corporate headquarters to meet with your manager and take care of any business you may have with the divisional or corporate officers. Today you are at headquarters and should plan to brief the Director of Manufacturing on the status of your plant. You are being joined by the Auto Glass plant manager. The position of Glass Piping plant manager is temporarily vacant. During the interim the Director of Manufacturing, in addition to other duties, is responsible for managing the Glass Piping plant.

Generating and maintaining customers for existing and potential products made in your plant are the responsibilities of the Director of Sales and Marketing. All design or modification of equipment, technology, or products is the responsibility of the Director of Product Development.

PLANT MANAGER, GLASS PIPING

JOB DESCRIPTION

The manager of Glass Piping is responsible for a plant that produces industrial piping for use by wineries, dairies, and the chemical industry, as well as associated insulation products for this piping.

Glass Piping is one of three plants in the Industrial Glass Division. The other plants are Auto Glass, which produces components for and completed units of auto windows and windshields, and Specialty Glass, which produces oven, aircraft, and spacecraft windows.

Each of the plant managers report directly to the Director of Manufacturing. Every two months the plant managers travel to corporate headquarters to meet with their boss to take care of any business they have with the divisional and corporate officers. At present the position of plant manager for Glass Piping is vacant; in the interim, the Director of Manufacturing, in addition to all regular duties, is responsible for managing the Glass Piping plant.

All sales of products made in the Glass Piping plant are the responsibility of the Director of Sales and Marketing. The Director of Product Development is responsible for all design and modification of equipment, technology, or products.

LOOKING GLASS
Corporate Offices

To: President

From: Corporate Personnel

Re: Industrial Glass Division's Annual Salary Information for Previous Year

C O N F I D E N T I A L

Copies to:

VP, IGD

VICE-PRESIDENT

Time in position: 4 years

Salary & bonus: $117,600

DIRECTOR OF MANUFACTURING

Time in position: 4 years

Salary: $73,500

DIRECTOR OF PRODUCT DEVELOPMENT

Time in position: 9 years

Salary: $77,200

DIRECTOR OF SALES AND MARKETING

Time in position: 1 year

Salary: $67,900

PLANT MANAGER, AUTO GLASS

Time in position: 2 years

Salary: $59,200

PLANT MANAGER, SPECIALTY GLASS

Time in position: 5 years

Salary: $51,600

PLANT MANAGER, GLASS PIPING

Temporarily vacant

Salary range: $45-55,000

LOOKING GLASS
Corporate Offices

To: Director of Manufacturing, IGD

From: Corporate Personnel

Re: Salary Information

C O N F I D E N T I A L

Copies to:

DIRECTOR OF MANUFACTURING

Time in position: 4 years

Salary: $73,500

PLANT MANAGER, AUTO GLASS

Time in position: 2 years

Salary: $59,200

PLANT MANAGER, SPECIALTY GLASS

Time in position: 5 years

Salary: $51,600

PLANT MANAGER, GLASS PIPING

Temporarily vacant

Salary range: $45-55,000

LOOKING GLASS
Corporate Offices

To: Director of Sales and Marketing, IGD

From: Corporate Personnel

Re: Salary Information

C O N F I D E N T I A L

Copies to:

Time in position: 1 year

Salary: $67,900

LOOKING GLASS
Corporate Offices

To: Director of Product Development, IGD

From: Corporate Personnel

Re: Salary Information

C O N F I D E N T I A L

Copies to:

Time in position: 9 years

Salary: $77,200

LOOKING GLASS
Corporate Offices

To: Plant Manager, Auto Glass

From: Corporate Personnel

Re: Salary Information

C O N F I D E N T I A L

Copies to:

Time in position: 2 years

Salary: $59,200

LOOKING GLASS
Corporate Offices

To: Plant Manager, Specialty Glass

From: Corporate Personnel

Re: Salary Information

C O N F I D E N T I A L

Copies to:

Time in position: 5 years

Salary: $51,600

LOOKING GLASS
Corporate Offices

To: Listed Below

From: Corporate Personnel

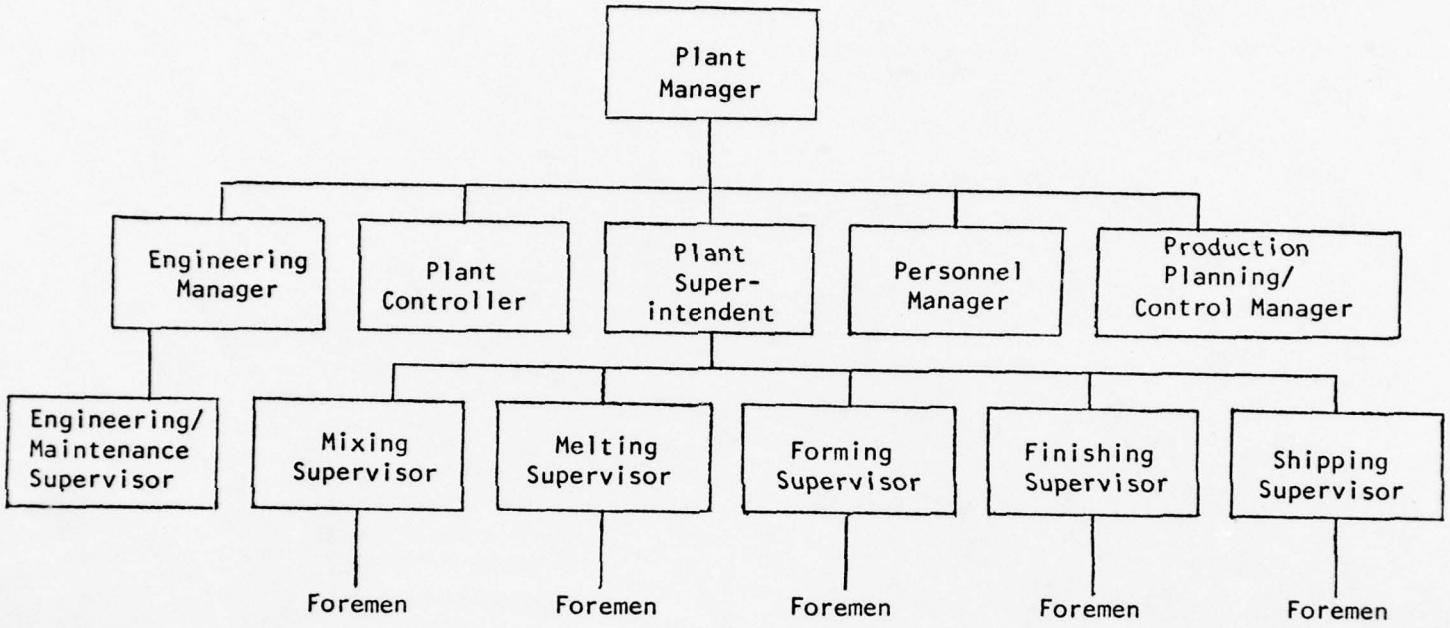
Re: Plant Structure

Copies to:

VP, IGD
DIR-MFG, IGD
DIR-S&M, IGD
DIR-PD, IGD
PM-AUTO
PM-SPECIALTY

Because the structure of the plants in the Industrial Glass Division has changed periodically, we are sharing with you the basic reporting structure currently operating in all three plants. In the past both the Personnel and the Production Planning/Control functions were subsumed under other offices. Now they report directly to the plant managers. These changes reflect our awareness of the increasing importance of these two staff functions.

ORGANIZATIONAL CHART - IGD PLANTS



LOOKING GLASS
Corporate Offices

To: Plant Manager, Specialty Glass

From: Corporate Personnel

Re: Seminar Dealing with Problem Employees

Copies to:

VP, IGD
DIR-MFG, IGD

I want to repeat an offer I made six months ago to conduct a five-day workshop with all of your personnel specialists on dealing with problem employees. Yours is the only plant in Looking Glass that has not signed up for the workshop. The workshop has received most favorable ratings from the participants. It succeeds partly because there is not a lot of preaching, but rather frequent hands-on experiences. We charge $300 per participant to the division. Each personnel group goes away expert at implementing programs dealing with employee theft, problem drinking, etc.

LOOKING GLASS
Corporate Offices

To: Director of Manufacturing, IGD

From: Corporate Personnel

Re: Affirmative Action: Plant Distributions

Copies to:

Here is a more detailed look at employment patterns for minority groups:

		Management	Professionals	Hourly
Auto	Male	98%	92%	72%
	Female	2%	8%	28%
Specialty	Male	94%	98%	85%
	Female	6%	2%	15%
Piping	Male	88%	77%	55%
	Female	12%	23%	45%
Auto	White	98%	99%	91%
	Minority	2%	1%	9%
Specialty	White	94%	98%	69%
	Minority	6%	2%	31%
Piping	White	82%	95%	90%
	Minority	18%	5%	10%

Auto Glass needs to push harder in hiring minorities and women.

LOOKING GLASS
Corporate Offices

To: Vice-President, IGD

From: Corporate Personnel

Re: Unions

Copies to:

PRESIDENT

The following statistics deserve your attention. They relate to our attempts to keep plants nonunion. In the past two months hourly employees in the Auto Glass and Specialty Glass plants voted on the question of whether or not to unionize. The results are:

	% YES	
	This month	Two years ago
Auto Glass	39%	15%
Specialty Glass	27%	23%

Clearly the employees at Auto Glass are inclining toward joining a union. This is a large, highly visible plant. Some work needs to be done to figure out what is going wrong at Auto Glass. Some possible factors are:

1. The plant is too large (763 hourly employees) making the workers feel their best interests are not being kept in mind.

2. The section of Ohio the plant is located in is strongly prounion.

3. The efficiencies caused by the introduction of the float process have forced a number of layoffs.

To repeat, these data deserve our attention.

LOOKING GLASS
Corporate Offices

To: Vice-President, IGD

From: Corporate Personnel

Re: Performance Appraisal

Copies to:

It is again time to conduct a performance appraisal on the Director of Sales and Marketing. Three copies of the appraisal form are attached. Send to this office at your earliest convenience the completed appraisal form (keeping a copy for your records), along with a salary recommendation.

Position:	Director of Sales and Marketing, Industrial Glass
Time in position:	1 year
Current salary:	$67,900
Salary range for position:	$65,000-85,000
Cost of living increase:	7%

I suggest you give a copy of the blank evaluation form to the subordinate for a self-evaluation. Your subordinate's ratings can be compared with your own. This can be informative.

LOOKING GLASS

CORPORATE OFFICES

NAME OF EMPLOYEE_____ DATE_____

JOB TITLE_____

IMPORTANT--Be sure you consider only one characteristic at a time, regardless of how good or poor he/she may be in the others. It is essential that every question be answered; if more space is needed to answer any item, please write on plain paper and attach to this form. Your overall rating on each factor should be shown by code symbol in the box to the right. Mark "O" for Outstanding; "E" for Excellent; "SP" for Satisfactory Plus; "S" for Satisfactory; "SM" for Satisfactory Minus; "U" for Unsatisfactory.

A. QUALITY OF WORK — Insert Rating Code ☐
Comments:

B. QUANTITY OF WORK — Insert Rating Code ☐
Comments:

C. ABILITY TO PLAN AND UNDERSTAND WORK — Insert Rating Code ☐
Comments:

D. ABILITY TO GET ALONG WITH OTHERS — Insert Rating Code ☐
Comments:

E. OVERALL PERFORMANCE RATING (ALL FACTORS) — Insert Rating Code ☐
Comments:

If performance of any of above is below expectations, what should be done to bring about improvements?

PREPARED BY_____ DATE_____

REVIEWED AND
APPROVED BY_____ DATE_____
(Your immediate supervisor)

RECORD OF INTERVIEW:
This report was discussed with the employee on_____
(Date)

Signed_____
(Employee)

CORP-62B

LOOKING GLASS
Corporate Offices

To: Director of Manufacturing, IGD

From: Corporate Personnel

Re: Performance Appraisal

Copies to:

I need completed a performance appraisal within 30 days on one of your plant managers--from the Specialty Glass plant. Please complete and return one of the three attached appraisal forms. We also need your salary recommendations for the individual.

Time in position:	5 years
Current salary:	$51,600
Salary range for position:	$45-65,000
Highest allowed increase:	16%
Adjusted cost of living increase:	7%

While not corporate policy, some managers have found it useful to give a copy of the appraisal form to the subordinate and ask for a self-evaluation. You can then check the employee's perceptions against yours. This comparison can be informative.

LOOKING GLASS

CORPORATE OFFICES

NAME OF EMPLOYEE_____ DATE_____

JOB TITLE_____

IMPORTANT--Be sure you consider only one characteristic at a time, regardless of how good or poor he/she may be in the others. It is essential that every question be answered; if more space is needed to answer any item, please write on plain paper and attach to this form. Your overall rating on each factor should be shown by code symbol in the box to the right. Mark "O" for Outstanding; "E" for Excellent; "SP" for Satisfactory Plus; "S" for Satisfactory; "SM" for Satisfactory Minus; "U" for Unsatisfactory.

A. QUALITY OF WORK — Insert Rating Code ☐
Comments:

B. QUANTITY OF WORK — Insert Rating Code ☐
Comments:

C. ABILITY TO PLAN AND UNDERSTAND WORK — Insert Rating Code ☐
Comments:

D. ABILITY TO GET ALONG WITH OTHERS — Insert Rating Code ☐
Comments:

E. OVERALL PERFORMANCE RATING (ALL FACTORS) — Insert Rating Code ☐
Comments:

If performance of any of above is below expectations, what should be done to bring about improvements?

PREPARED BY_____ DATE_____

REVIEWED AND
APPROVED BY_____ DATE_____
(Your immediate supervisor)

RECORD OF INTERVIEW:
This report was discussed with the employee on_____
(Date)

Signed_____
(Employee)

CORP-63B

LOOKING GLASS
Corporate Offices

To: Vice-President, IGD

From: Corporate Personnel

Re: Advanced Management Course

Copies to:

DIR-MFG, IGD

We have a spot in our advanced management course for one of your promising plant managers. The course is one week long, and covers financial analysis, leadership skills, and organizational development. Successful completion of this course qualifies the manager for our Executive Training program.

If you want to send someone, please let me know right away. The course begins in three weeks and we're trying to close the roster. The class is limited to 10 people.

LOOKING GLASS
Corporate Offices

To: Vice-President, IGD

From: Corporate Personnel

Re: Hourly Pay Rates

Copies to:

PRESIDENT
DIR-MFG, IGD

I recently got hold of some industry data on wages for hourly employees:

	Five Years From Now	This Year	Five Years Ago
Flat Glass Industry	$8.86*	$6.06	$4.26
Industrial Glass Division	$7.82*	$5.93	$5.03

*Projection based on current formulas in use.

Quite frankly, these figures shocked me. We've always prided ourselves on paying well. However, it seems that the cost-cutting of the past several years has placed us a bit below average.

LOOKING GLASS
Corporate Offices

To: President

From: Corporate Personnel

Re: Affirmative Action Distributions: Industrial Glass Division

Copies to:

VP, IGD
DIR-S&M, IGD
DIR-PD, IGD
DIR-MFG, IGD
PM-AUTO
PM-SPECIALTY

% OF FULL-TIME EMPLOYEES
BY SEX, RACE, AND JOB TYPE

	MANAGEMENT	PROFESSIONAL	HOURLY
MALE	96%	90%	69%
FEMALE	4%	10%	31%
WHITE	95%	99%	89%
MINORITY	5%	1%	11%

LOOKING GLASS
Corporate Offices

To: Those Listed

From: Corporate Controller

Re: Financial Summaries, Industrial Glass Division

Copies to:

VP, IGD
DIR-S&M, IGD
DIR-PD, IGD
DIR-MFG, IGD

Attached are the following financial summaries for the Industrial Glass Division:

- Income statement, last fiscal year;
- Financial statement, last fiscal year;
- Division assets and current liabilities.

Also attached are the sales and cost of goods manufactured summaries for the first quarter of this year.

LOOKING GLASS
INDUSTRIAL GLASS DIVISION

INCOME STATEMENT
(In Thousands)

	DIVISION		AUTO GLASS		SPECIALTY GLASS		GLASS PIPING	
	Latest Year	Previous Year	Latest Year	Previous Year	Latest Year	Previous Year	Latest Year	Previous Year
NET SALES	$87,000	$73,600	$57,800	$52,700	$14,000	$7,600	$15,200	$13,300
COST OF GOODS SOLD	64,370	53,738	44,390	39,920	9,500	4,728	10,480	9,120
SALES, G & A	5,900	5,400	3,300	3,080	1,130	1,060	1,470	1,260
R & D	4,600	4,412	2,500*	2,400*	1,700*	1,600*	400*	412*
ASSIGNED TAXES & INTEREST	7,520	7,002	4,100	3,900	1,420	1,302	2,000	1,800
NET INCOME FROM PRIMARY OPERATIONS	$4,610	$3,018	$3,510	$3,400	$250	($1,090)	$850	$708
*assigned to plants								
MARKET RANK			2	2	12	16	4	5
MARKET SHARE (%)			21.3%	19.8%	4.2%	3.8%	13.6%	10.2%

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

CURRENT FINANCIAL RATIOS

	DIVISION	AUTO GLASS	SPECIALTY GLASS	GLASS PIPING
DEBT TO EQUITY	32.6	----	----	----
RETURN ON EQUITY	7.8	----	----	----
RETURN ON ASSETS	5.4	7.6	1.5	3.8
RECEIVABLES TURNOVER	8.5	7.8	7.2	10.8
COST OF GOODS SOLD AS % OF SALES	73.9%	76.8%	67.8%	68.9%
R & D AS % OF SALES	5.3%	4.3%	12.1%	2.6%
OPERATING PROFIT MARGIN AS % OF SALES	13.9%	13.2%	11.9%	18.8%

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

SELECTED BALANCE SHEET ACCOUNTS

LATEST YEAR
(In Thousands)

CASH	$8,926
RECEIVABLES	10,220
INVENTORIES	8,950
PLANT AND EQUIPMENT	38,102
OTHER ASSETS	19,470
CURRENT LIABILITIES	7,260

ASSETS ASSIGNED TO PLANTS (In Millions)

AUTO GLASS	$46.2
SPECIALTY GLASS	$17.1
GLASS PIPING	$22.4

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

COST OF GOODS MANUFACTURED
(In Thousands)

LAST QUARTER

BUDGET	ACTUAL	VARIANCE
$7,593	$7,889	+4%

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

SALES
(In Thousands)

LAST QUARTER

FORECAST	ACTUAL	VARIANCE
$24,446	$24,779	+1%

LOOKING GLASS
Corporate Offices

To: Listed Below

From: Corporate Controller

Re: Financial Position

Copies to:

DIR-MFG, IGD
PM-AUTO
PM-SPECIALTY

Attached are the financial summaries for the last fiscal year both for the division and for each of the plants.

LOOKING GLASS
INDUSTRIAL GLASS DIVISION

INCOME STATEMENT
(In Thousands)

	DIVISION		AUTO GLASS		SPECIALTY GLASS		GLASS PIPING	
	Latest Year	Previous Year	Latest Year	Previous Year	Latest Year	Previous Year	Latest Year	Previous Year
NET SALES	$87,000	$73,600	$57,800	$52,700	$14,000	$7,600	$15,200	$13,300
COST OF GOODS SOLD	64,370	53,738	44,390	39,920	9,500	4,728	10,480	9,120
SALES, G & A	5,900	5,400	3,300	3,080	1,130	1,060	1,470	1,260
R & D	4,600	4,412	2,500*	2,400*	1,700*	1,600*	400*	412*
ASSIGNED TAXES & INTEREST	7,520	7,002	4,100	3,900	1,420	1,302	2,000	1,800
NET INCOME FROM PRIMARY OPERATIONS	$4,610	$3,018	$3,510	$3,400	$250	($1,090)	$850	$708
*assigned to plants								
MARKET RANK			2	2	12	16	4	5
MARKET SHARE (%)			21.3%	19.8%	4.2%	3.8%	13.6%	10.2%

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

CURRENT FINANCIAL RATIOS

	DIVISION	AUTO GLASS	SPECIALTY GLASS	GLASS PIPING
DEBT TO EQUITY	32.6	----	----	----
RETURN ON EQUITY	7.8	----	----	----
RETURN ON ASSETS	5.4	7.6	1.5	3.8
RECEIVABLES TURNOVER	8.5	7.8	7.2	10.8
COST OF GOODS SOLD AS % OF SALES	73.9%	76.8%	67.8%	68.9%
R & D AS % OF SALES	5.3%	4.3%	12.1%	2.6%
OPERATING PROFIT MARGIN AS % OF SALES	13.9%	13.2%	11.9%	18.8%

LOOKING GLASS
Corporate Offices

To: Vice-President, IGD

From: Corporate Controller

Re: Energy Costs

Copies to:

DIR-MFG, IGD
PM-AUTO
PM-SPECIALTY

Energy costs for each plant are listed below (in millions):

		LATEST YEAR	PREVIOUS YEAR	FIVE YEARS AGO
AUTO GLASS	Gas	$2.7	$2.3	$1.1
	Electric	1.2	.8	.3
SPECIALTY GLASS	Gas	1.2	.8	.5
	Electric	.4	.5	.2
GLASS PIPING	Gas	1.8	1.4	1.2
	Electric	.8	.4	.2

LOOKING GLASS
Corporate Offices

To: Vice-President, IGD

From: Chairman of the Board

Re: Community Service Organization

Copies to:

I have worked closely with the Community Service Organization for years, and found them to be an active, valuable part of our community. They sponsor a variety of programs which directly benefit the whole spectrum of our community. I'd like to help them out financially and have agreed to ask our division heads to help. I'm doing my part by serving as honorary chairman for their funding drive. Would you be willing to organize a fund raising campaign in IGD? I appreciate your support.

While it may be premature, could you venture a guess as to what your divisional quota should be? Please let me know.

LOOKING GLASS
Corporate Offices

To: Vice-President, IGD

From: Corporate Personnel

Re: Staff Replacement

Copies to:

PRESIDENT

The opening of the Plant Manager position at Glass Piping is an opportunity for you to use our services in identifying high-potential managers within Looking Glass, managers who could ably fill the open position. Please let us know if we can be of any assistance.

VOLUME IV

INDUSTRIAL GLASS DIVISION

IV. To/From Roles Within IGD

IGD-1 to IGD-90

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Secretary

Re: Homecoming

Copies to:

It's that time of the year again. Are you still planning to order tickets for the corporate box for the next homecoming game? The last we talked about this you said you were planning to invite key divisional staff to the game and to your house for brunch beforehand. If you are still planning on this outing, please send me the list of guests (we need individual names).

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Secretary

Re: College Advisory Board

Copies to:

The local college administration is badgering me to get an answer from you. Will you or will you not accept their invitation to chair the advisory board for their experimental Mechanical Engineering Program?

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Secretary

Re: Speech for Business School

Copies to:

Today I received a call from the Professor of Operations Research at the local state university. He wanted me to confirm your participation in a symposium to be held for his students next week. He asked for a title for your talk. Please advise so I can pass it on to him.

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Secretary

Re: Anniversary Dinner

Copies to:

The quarterly anniversary dinner to hand out five, ten and twenty-five year pins is next Tuesday. You are expected to attend. (I notice from your calendar that you are scheduled to be out of town visiting the District III sales force. I just thought you ought to be advised).

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Secretary

Re: Rotary Club

Copies to:

Last week you asked me to remind you that today is the deadline to decide on the request by the Rotary Club that you head their Membership Committee. I will draft the letter once I know your decision.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Secretary

Re: Picnic Grounds

Copies to:

The number of requests for weekend use by employees of our picnic grounds is getting totally out of hand. The backlog is over two months for weekends. I understand the privilege is being abused by some (alcoholic beverages are being consumed, and the area is often left in complete disarray). It's hard to figure out exactly who is misusing the facilities, but I understand it's mostly some new employees from the packing area on the third shift.

Could you do something about the backlog and use of the facilities? i hate to see people ruin such a new facility.

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Secretary

Re: Quarterly Sales Dinner

Copies to:

The president's secretary asked me to remind you of tomorrow night's Sales Award Dinner. You are expected to speak about past sales in the Industrial Glass Division. The president's office is coordinating this and would like to know (a) how long you plan to speak, (b) whether you need audiovisual aids, and (c) what, in general, you'll say (the President was apparently annoyed by the last awards dinner in which his speech was preempted).

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Director of Sales and Marketing, IGD

Re: Cost-Cutting

Copies to:

DIR-S&M, APD

Two of my district sales managers have just called me, irate over new belt-tightening policies supposedly being implemented corporate-wide. They had both spoken with a district sales manager from the Commercial Glass Division, who apparently told them that the President was dissatisfied with the increasing overhead associated with sales and marketing, and was instituting such cost-cutting rules as:

- No first-class air travel;
- Rigorous review of travel vouchers;
- Exclusion of special customer discounts.

Needless to say, this all caught me by surprise. Could you fill us in on the details of this cost-cutting, like when and why it is taking place, what other sales practices will be affected, etc.?

At a time when sales in Industrial Glass are increasing nicely (46% in two years) this is going to be a policy change difficult to explain, much less defend, to the troops.

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Secretary

Re: Increased Job Responsibilities

Copies to:

In my last performance appraisal we discussed the value of my trying out new things to help me "develop my potential" (those were your words). You assigned me the job of coming up with three developmental projects.

Here they are:

1. Take a two-day AMA course on executive secretarial skills.

2. Write your external correspondence (for your review, of course).

3. Talk to you about how the budget figures I type so often are calculated. This would help me check your figures, something I'm not good at now.

You asked me to put these three into objectives and say how I would measure whether I did them well or not. I'm having trouble with that. Could you please help me?

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Secretary

Re: Summer Employment

Copies to:

John Martin called (he retired several years ago, was the Plant Superintendent at Auto Glass when you were Plant Manager there) to ask if you could find a job for his grandson in the Auto Glass plant for summer vacation. Mr. Martin said the young man was "a fine young buck who could put his nose to the wheel." He is apparently majoring in engineering and is considering a career with Looking Glass. Would you like me to draft a "Dear John" letter?

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Plant Manager, Specialty Glass

Re: Job Change

Copies to:

I understand the plant manager position for the planned capacitors plant in the Advanced Products Division is open. This is to inform you that I would like to be considered for that post and would hope you'll support me in that move.

My current job has been most rewarding, particularly under your leadership. You have taught me much about effective managing. I've always admired your ability to combine a tough bottom-line stance with a real concern for people. This is a managing strategy I've tried to emulate.

The more relevant issue is that I've been in this post for five years and feel the course has been set. I need a greater variety of manufacturing experiences, and believe the job involved in starting up a production process for a highly technical product line would serve that purpose.

I would appreciate your consideration of this request.

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Plant Manager, Specialty Glass

Re: Summer Employment

Copies to:

It's time to look ahead to next summer and the question of what students we hire. While the current practice of hiring employees' kids has merits, I'd like to suggest a change.

An important issue I'm struggling with (as I'm sure the other plant managers are) is how to get the top graduates from the local state university to stay in town and apply for positions in the plant. There are highly qualified graduates in the Operations Research, Marketing, and various Engineering programs who could nicely fill some empty slots or allow us to bump marginal employees. The problem is we don't have a chance to tell our story to these graduates.

I suggest we change our selection procedures for student summer employment as follows:

(1) Applications are allowed by employees' kids, but particularly encouraged on the part of college students in relevant programs. (I've already talked to the professor in charge of Operations Research at our local university. He thinks several of his top-notch students are likely to apply.)

(2) Jobs are given to applicants who might be subsequent candidates for professional or managerial slots in the corporation.

(3) The local plant manager has final say on who gets hired and who doesn't. (It is not helpful to be told at the last minute to find a slot for a second cousin's son of a director from another division.)

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Secretary

Re: Tennis Anyone?

Copies to:

While you were out yesterday, the President called. You and your spouse/friend are invited to an afternoon of tennis and cocktails next Saturday at the President's home. Apparently several other couples will be joining you. Please inform the President of your decision today.

By the way, I understand the President is a tiger on the court!

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Secretary

Re: Tennis

Copies to:

While you were out yesterday, the President called. You and your spouse/friend are invited to an afternoon of tennis and cocktails (I think in that order) at the President's house next Saturday. You'll be joined by several other couples. Please inform the President of your decision today.

I understand it's not wise to win consistently on the President's court!

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Secretary

Re: Tennis with the President

Copies to:

While you were out yesterday, you received a call from the President. You and your spouse/friend are invited to an afternoon of tennis and cocktails (I think in that order) at the President's home next Saturday afternoon from 2-6. The President mentioned something about wanting to get to know better some key corporate staff from the best division. You will be joined by several other couples from Industrial Glass. Please inform the President of your decision by late today.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Secretary

Re: United Way

Copies to:

Tomorrow you are scheduled to attend a luncheon to receive the award for top corporate contribution to United Way. You'll be expected to make an acceptance speech (I was told no longer than 5 minutes--people have to get back to work). If you will outline your speech, I will type it on 3x5 cards for you.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Secretary

Re: Reminder

Copies to:

This Saturday the plant's team will be playing in the finals of the local industrial tournament. The team is red hot this year and has quite a reputation. The captain of the team called to give you a special invitation. They will have beer and hot dogs after the game and would like you to join them and their families. The game will be from 3:00-5:00 p.m. If you tell me your decision, I'll pass it on.

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Secretary

Re: Reminder - Speech

Copies to:

Several weeks ago you agreed to give a speech on marketing strategies used for our automobile windows and windshields at the next annual meeting of the National Glass Manufacturers Association in Miami Beach. The convention manager called yesterday while you were out to request a title and a short abstract (no more than 100 words) summarizing your talk. He seemed to be in a big hurry. Sounds like a great place to make a speech!

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Secretary

Re: Reminder - Junior Achievement

Copies to:

The local chapter of Junior Achievement will be touring the plant tomorrow. You are scheduled to finish their tour with a fifteen minute talk on the free enterprise system and why it works.

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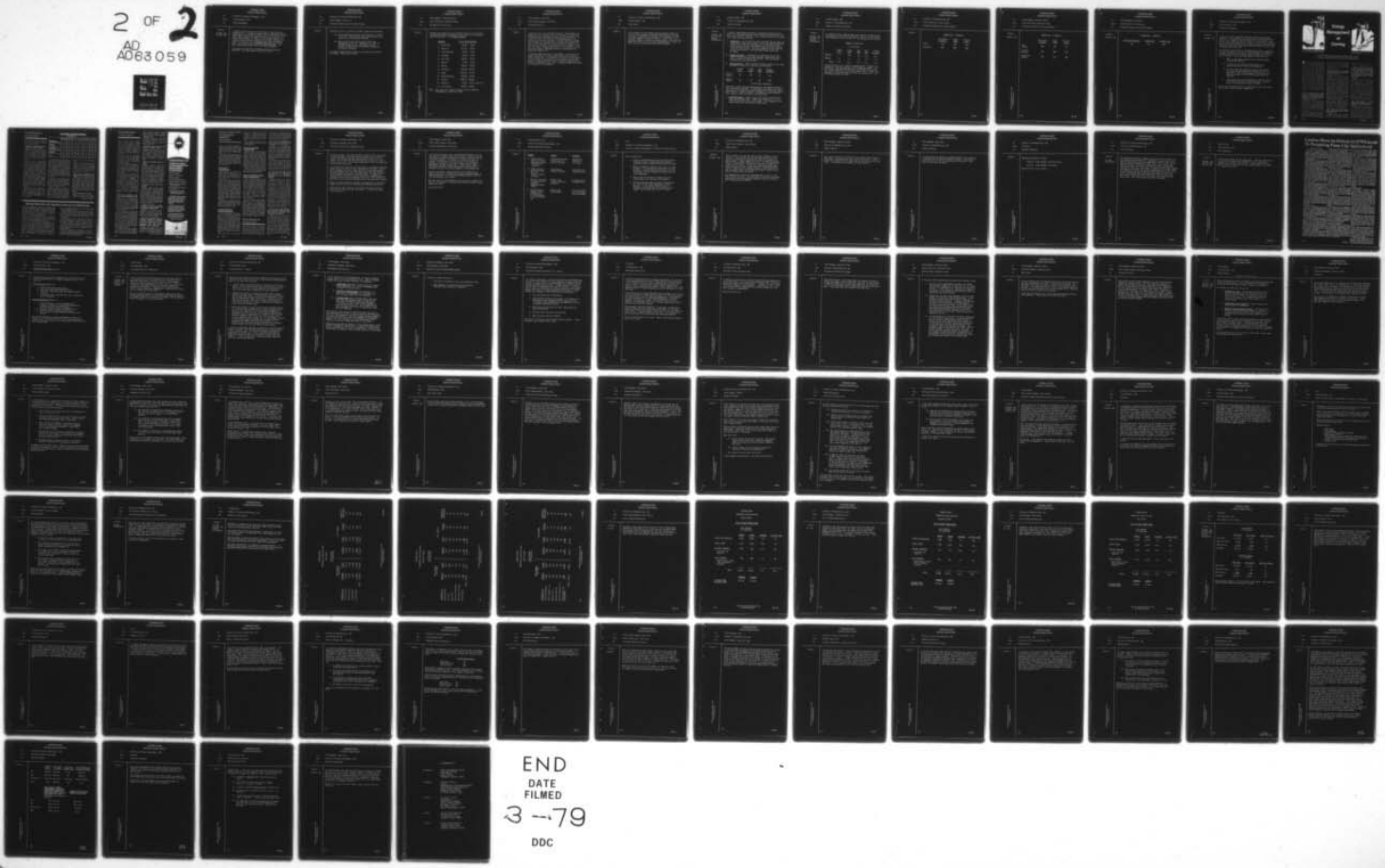

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LOOKING GLASS
Industrial Glass Division

To: Director of Product Development, IGD

From: Vice-President, IGD

Re: Staff Development

Copies to:

DIR-MFG, IGD
DIR-S&M, IGD

I know the liaison roles your staff serve in the plants are demanding ones. I suggest strongly that you develop a low-cost, quick-impact strategy for building skills in your staff. The recent blow up among the members of the project team in the Glass Piping factory is a case in point of how critical it is to have strong, effective leadership by Product Development staff. By the way, let's go <u>beyond</u> suggestions to send the staff to the next AMA workshop on project management. We don't need to add to the list of the walking wounded.

I'm copying the Directors of Manufacturing and Sales and Marketing. You might consult them in this area.

LOOKING GLASS
Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Sales Manager, District I

Re: Potential Market Growth for Glass Piping

Copies to:

According to the U.S. Bureau of Alcohol, Tobacco and Firearms:

(1) Since 1970 there has been a 41% increase in wineries in the U.S. There are now about 615 wineries in 30 states (led by California with 353).

(2) Major wineries are bullish about future wine consumption in the U.S. They point out that the average American drinks 1.8 gallons of wine annually, compared with 27.4 gallons consumed by the average Frenchman.

I'd suggest Looking Glass initiate a new sales thrust toward this market. What do you think?

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Plant Controller, Specialty Glass

Re: Raw Materials Price List

Copies to:

Through some detective work I was able to get a list of prices (ranging from lowest to highest bid for each of our frequently used raw materials). (From Glass Industry)

MATERIAL	F.O.B. PRICE PER TON	
1. Glass Sand	$2.65 - 6.00	
2. Soda Ash	$31.50 - 36.00	
3. Lime (calcite)	$2.50 - 8.00	
4. Feldspar	$8.50 - 16.00	
5. Salt Cake	$28.00 - 31.00	
6. Gypsum	$7.00 - 10.00	
7. Barite	$24.00 - 30.00	
8. Fluorspar	$75.00 - 100.00	
9. Borax	$103.00 - 113.00	
10. Sodium Nitrate	$55.00 - 64.00	
11. Arsenic	$150.00 - 240.00	
12. Selenium	$9.00 - 10.00	(per lb.)
13. Iron Pyrite	$50.00 - 100.00	

NOTE: The prices are a couple of years old and should be increased by a factor of 10-15%.

LOOKING GLASS
Industrial Glass Division

To: Plant Manager, Auto Glass

From: Plant Superintendent, Auto Glass

Re: Personnel Decision

Copies to:

I need your O.K. on a personnel decision. Frank Seames, an employee in our finishing room, was seriously injured three months ago while handling a large piece of plate glass. He claims the piece was defective and collapsed on him. My sources tell me he was careless. We have carefully trained the employees in that room how to and how not to handle the glass. The effectiveness of this training is shown by the fact that we've had no injuries (until this incident) in the past two years. Seames' boss feels he is milking all he can get out of worker's compensation and is staying home far beyond the needed time.

In general Seames has been a troublemaker. He has been constantly agitating for a union ever since he came into the plant 12 years ago. I'm planning to fire him. Do you agree? I know we have to be careful in firing people now that the feds are breathing down our backs. Could you check with the Director of Manufacturing to see if corporate guidelines would be violated by firing Seames?

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Vice-President, IGD

Re: Sales Award

Copies to:

The President will be holding a special awards banquet for district sales managers throughout Looking Glass. He wants to present a plaque and a few words of encouragement to the top sales manager from each division. I think this is an excellent chance to reward our top performers. Pick your best people and compile lists of their accomplishments. Then I'll meet with you to decide who should get the award.

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Director of Manufacturing, IGD

Re: Industry Outlook

Copies to:

DIR-S&M, IGD
DIR-PD, IGD
PM-AUTO
PM-SPECIALTY

I recently asked Glass Associates, a nationwide consulting firm expert in glass manufacturing, to brief me on the outlook for the flat glass industry in general, with a specific focus on auto glass. Here's what they came up with:

1. Production: In the last five years the float glass process has replaced the sheet glass process. Five years ago 50% used the sheet process, 50% the float process; in the latest survey (almost two years old), over 80% of plate glass was produced using the float process. Our early emphasis on the total use of the float process in the Auto Glass plant clearly was warranted.

2. Production Costs: In the past five years the cost of the higher priced float glass declined 23%, whereas sheet glass costs increased 13% during that period. This cost factor increased the push toward float.

3. Imports-Exports: There has been a profound change in the ratio of exports to imports in the area of flat glass:

	10 Years Ago	5 Years Ago	Last Year	5 Years From Now
Value of Imports	68	86	69	130
Value of Exports	38	45	110	255

(In Millions of Dollars)

These data reflect the continued decline of the American dollar on the international exchange. If the dollar stays weak, U.S.-made flat glass will become increasingly competitive on the world market (particularly in Western Europe). The amount of glass exported still remains a small percent of the total sold.

4. Long-Term Growth: Industry wide, $1.6 billion worth of flat glass was sold last year. Eight years from now, it is predicted that $2.55 billion will be sold. This represents a 6% annual growth rate for the next eight years.

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Director of Manufacturing, IGD

Re: Update on Industrial Forecast

Copies to:

DIR-S&M, IGD
DIR-PD, IGD
PM-AUTO
PM-SPECIALTY

In response to your question about more specific forecasts from the consulting firm, Glass Associates, I was able to get them to track automobile sales for the U.S. The figures are as follows:

NUMBER OF AUTOS SOLD

(In Millions)

	3 Years Ago	2 Years Ago	Last Year	This Year	5 Years From Now
DOMESTIC	7.1	8.8	9.5	10.1	13.5
FOREIGN	1.3	1.4	1.5	1.6	2.1
TOTAL	8.6	10.3	11.0	11.7	15.6

The prediction is for a steady 6% annual growth in domestic car production. The real unknown is the foreign car market. The switching of manufacturing capacities by foreign firms to the U.S. should allow them to sell more competitively. Clearly the estimates for future foreign car sales are conservative. The consultants agreed with that.

LOOKING GLASS
Industrial Glass Division

To: Director of Manufacturing, IGD

From: Plant Controller, Glass Piping

Re: Production Capacity Utilization Report

Copies to:

PRODUCTION: % CAPACITY

	Most Recent Quarter	Latest Year	Previous Year
Piping	94%	94%	93%
Insulation	98%	89%	86%

LOOKING GLASS
Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Plant Controller, Specialty Glass

Re: Production Capacity Utilization Report

Copies to:

DIR-MFG, IGD

PRODUCTION: % CAPACITY

	Most Recent Quarter	Latest Year	Previous Year
Oven Windows	105%	97%	91%
Aircraft Windows	90%	98%	101%
Spacecraft Windows	86%	93%	89%

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Plant Controller, Auto Glass

Re: Production Capacity Utilization Report

Copies to:

DIR-MFG, IGD

PRODUCTION: % CAPACITY

Most Recent Quarter	Latest Year	Previous Year
97%	91%	88%

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Vice-President, IGD

Re: Energy Cost Reduction

Copies to:

DIR-MFG, IGD

I think it's time to generate some more ideas for energy use reduction. Your campaign of two years ago was highly effective, and I'm still amazed at the 22% reduction in use of natural gas you and your troops were able to create in the furnaces. However, we are facing an increase of 6% in electric rates, and the deregulation of natural gas being pushed by the President can only mean increased rates there, too.

I've talked with the Director of Manufacturing and he suggested that you use today's visit by the Plant Managers to Corporate to do some thinking with them about reducing energy use. By the end of the day, I would like some ideas on issues such as:

1. Where in the plants should we focus greater energy conservation efforts?

2. Is there any one plant we should focus on, or should we tackle all three simultaneously?

3. How can we get the troops out on the line to understand that energy conservation affects us all? I must admit I got furious seeing all of the cutting machines running in the finishing room during the noon hour.

4. I know some plant superintendents are doing a really good job saving energy in their own ways. How can we get these projects shared with others?

By the way, the attached article might help you get some ideas. See me later today with your suggestions.

David E. Leibson, vice president and director of the Manufacturing and Engineering Division.

Energy Management at Corning

Ralph P. Baker, Jr., director of purchases for Corning Glass Works.

Two officials discuss the energy situation and its effects on their company, and describe efforts to minimize future fuel problems

THE nation's recurring energy crises have had, and will continue to have, a significant impact on the operations of U.S. glass manufacturers. For this reason, the following interview with two officials of the Corning Glass Works seems especially appropriate and timely. In it, David E. Leibson, vice president and director of the Manufacturing and Engineering Division, and Ralph P. Baker, Jr., director of purchases, discuss the energy situation in general and how it has affected their company. They also describe measures being taken to help minimize the effects of future fuel shortages. The interview originally appeared in the January, 1977 issue of "The Gaffer," Corning's house organ.

Will you describe some of the progress that Corning Glass Works has made in conserving energy, particularly in terms of fuel savings in manufacturing processes?

Leibson: So far, we've made pretty good headway in our energy efficiency programs. We've been able to reduce our fuel consumption by about 12% compared to 1972, which is the base year used by the government. We still have a long way to go, however.

Last fall, Congress passed a bill essentially mandating that all energy-intensive industries adopt a conservation program to be completed by 1980. In the case of Corning, our goal is set at a 19% reduction in fuel usage. So, we have quite a target to shoot at, but we have made a good start.

What are some of the specific steps CGW plants have already taken to conserve energy?

Leibson: Well, about 50% of all the energy we use is consumed by melting operations; 30% by subordinate types of equipment, such as lehrs, kilns and forehearths; and 20% by finishing operations and for general heating and lighting. Our biggest effort, obviously, has been in the melting area, where our consumption is the greatest. There, through burner tip design, more insulation on furnaces, redesign of the regenerator system, and simply taking more care in terms of the amount of energy we use to melt a pound of glass, we've been able to make substantial progress.

The largest single area in which we've made the greatest gains is in our all-electric melting units. Our all-electric Vermel furnaces operate in some cases at three times the efficiency of our standard melters.

This sounds like CGW obtains energy savings and pollution control at the same time.

Leibson: Yes, we get a double bonus with these furnaces. We like to point out that they operate quietly, are cool, are energy-efficient, and are nonpolluting.

Is there a sharing of energy conservation information among plants? If one production superintendent, for example, hits upon a good energy-saving scheme in his facility, is it likely that this information will reach production people at other operations?

Leibson: In areas where there has been a basic change in technology, the information is disseminated quite broadly throughout the world via our engineering departments. I think that in some other areas, however, we can do a better job. I am sure there are things done in some plants to conserve energy that are not widely known. We try to use our facilities engineering group as a centralized source of energy information, but there are undoubtedly still a lot of good ideas out there of which we are unaware.

How many people in CGW engineering and facilities groups are working on energy conservation?

Leibson: We have an energy board of 12 members. The board represents all of the various specialties in the glass works that have some relationship to energy conservation. Then, if you look at all of the various engineering departments, you will note that each has some component involved with energy; I would say

Energy Management

Continued from page 17

that almost the entire engineering division has a concern with energy at some time or other

What is the situation CGW faces with regard to fuel availability?

Baker: Let's first look at the basic resources from which the country's energy is derived. The simplified chart accompanying this interview shows how energy is consumed in the U.S. The data comes from the U.S. Bureau of Mines for the year 1975.

Natural gas is a diminishing resource in the United States. Reserves have been declining since 1968, and actual output of natural gas has been decreasing since 1974. It's no longer a question of whether or not natural gas supplies will improve, but one of how rapidly will supplies diminish. As natural gas supplies start to run out, as they probably will within the next 10 years, consumption by industry will be curtailed to protect residential users as long as possible. Within 10 years or so, there will be no natural gas for industry, except for very specialized uses, such as for feedstocks to make chemicals and fertilizers.

Petroleum is also a diminishing energy resource. Demands for petroleum continue to rise, while domestic production declines. To meet domestic requirements, the U.S. must import some 40% of its total needs

Consumption of Energy Resources

(In Trillions of Btu's)

	Natural Gas	Petroleum	Coal	Hydro	Nuclear	Totals
Residential and Commercial Consumers	7,400	5,800	300	——	——	13,500
Industrial Consumers	9,000	5,600	4,300	——	——	18,900
Transportation (Autos, Planes, Trains)	600	18,000	——	——	——	18,600
Electric Power Generation	3,200	3,300	8,800	3,100	1,700	20,100
Totals	20,200	32,700	13,400	3,100	1,700	71,100

Coal is this nation's greatest fossil-type energy resource. There are huge coal reserves; however, there are limitations on how rapidly coal production, transportation and utilization capabilities can be stepped up. The important factor is the amount of time and cost involved in obtaining the additional mining equipment, railroad transportation facilities and the other physical needs for switching from natural gas and oil to coal.

There are very few locations left in this country where additional hydro facilities could be installed to expand electric power generation capacity. Hydro is thus a very limited source of additional energy.

Nuclear reactors for use in generating electric power appear to have the greatest potential for meeting the nation's increased energy needs. At the moment, however, serious obstructions to increasing our nuclear energy capabilities appear to have been created by political, social, and environmental factors.

As far as CGW's situation is concerned, our corporate-wide, domestic, natural gas curtailments average out as follows: in 1972, 6.2%; in 1973, 8.6%; in 1974, 9.4%; in 1975, 13.1%. Estimated curtailment for 1976 was 6.1%.

Why did the curtailment percentage drop so drastically last year?

Baker: It wasn't because more gas was available. It simply was the result of our many programs to conserve energy, to increase our energy-use efficiency and to convert from natural gas to electricity The above are overall averages. Actually, severe problems exist at some plant locations where gas supplies have been severely curtailed or even cut off entirely.

Can you offer some examples?

Baker: At Danville, Va., natural gas service has been curtailed 100%

continued on page 23

Raleigh Plant Records Significant Energy Cost Reductions

SIGNIFICANT reductions in resource and energy costs have been achieved at Corning Glass Works' Raleigh, N.C. plant due to a series of projects and actions undertaken since 1973. As a result, the electronics components plant's resource/energy cost reductions per piece reached 30% during 1975-76.

One of the recent improvements has been the installation of a total process cooling recirculation system which has produced a savings in purchased water of up to three million gallons a month.

"Our system was so effective at saving water," says Henry C. Young, production superintendent and conservation team manager, "that our water supplier, the City of Raleigh, called to see what our 'problem' was."

Another innovative system was devised to focus attention on savings in natural gas. It allows both heating of office space and the cooling of production areas simultaneously in an emergency, no-boiler situation. Tests indicate the offices can be kept at cool but comfortable temperatures with only heat piped from the production floor.

With the adoption of this system, it became possible to install a fuel oil conversion package on one boiler with an 8,000-gallon fuel reserve. "This reserve should see us through any foreseeable fuel shortages," Mr. Young notes.

The big surprise came in the form of savings in electrical power, most of which required little or no capital investment. According to Mr. Young, it was simply a matter of using all standard practices — from limited lighting reduction and air pressure reductions to manual instead of automatic control of air-conditioning start-up to minimize electricity-demand charges.

A study is under way to determine if sufficient savings would result from the installation of a computer to control peak demand and consumption. Preliminary results are said to be encouraging.

Continued from page 18

since November, 1975. Under Federal Power Commission regulations, we were permitted to purchase gas in Louisiana and contract with interstate pipelines to have it delivered to Danville. The cost of this gas is very high, but along with increased oil-burning capability, it has kept the plant operating at normal levels.

On Jan. 1, deep gas curtailments also went into effect at some other plants. Service was curtailed 100% at Danville, Ky., and we are operating there by using a combination of oil and propane.

At both Charleroi and State College, Pa., we were faced with a 75% curtailment, and plants such as Bradford and Greencastle, Pa., have had curtailments of up to 85%. Their ability to switch to oil kept them running

In the last two years, Corning has made significant progress in converting energy needs to electricity and in providing a capability to substitute oil for natural gas. Overall, the company has moved from a capability to switch some 50% of its natural gas requirements to oil to a position where it can now convert 70% of its gas requirements to oil or electricity. And we have a program where we will be in a position to back ourselves 100% with oil.

Aside from availability of fuels, isn't cost another important factor?

Baker: Yes, cost is indeed a very critical aspect of the energy problem. Today, CGW uses less energy in domestic operations than it did back in 1972, but its cost has skyrocketed. Since 1972, our average cost for natural gas has increased 121%; for electrical power, 8%; and for fuel oil, 150%.

At the same time, average cost per unit of energy we consume has jumped 144% — an increase seemingly out of proportion to the other increases mentioned. The reason for this is mix. For years, natural gas has been our most economical fuel. In 1972, 84% of our energy came from natural gas. Today, that percentage is down to 77%. We have been forced to substitute other, more expensive fuels.

So between the huge increases in the cost of each form of energy and the need to use more expensive fuels in place of gas, our total energy bill has increased sharply. For every dollar spent for energy in 1972, CGW spent $2.44 for an equivalent amount in 1976.

Leibson: Looking at it another way, in the early 1970s, the cost of energy was about 4% of our total manufacturing costs. Today, it's running about 10%.

From what areas do you see the greatest fuel savings coming?

Leibson: We believe that in the long term, electric melting will give us our greatest savings. Since our new furnace is very efficient in its use of energy, we believe we will make our greatest gains in fuel efficiency by switching to all-electric melters.

What is the timetable for this conversion?

Leibson: Because of the economics involved — the great cost of tearing down a conventional furnace and building a Vermel unit in its place — the prospect of switching to all-electric melting is not very attractive at the moment. However, as energy costs continue to rise and shortages become more severe, the conversion becomes more and more attractive, and we will begin to replace our standard furnaces with electric melting units.

Are there any other areas of opportunity?

Leibson: Another concerns waste glass. Our energy cost per pound of good product is greatly affected by the amount of waste glass we have coming from furnaces. We have some processes, such as those involving ribbon and turret chain machines, that are extremely inefficient in their use of melted glass. So long term, we can make some great gains in energy savings by reducing the amount of waste glass.

Wouldn't this involve a number of important process changes and technological developments?

Leibson: Yes, it would involve a number of important process changes; however, we do have concepts on the drawing board today to solve some of the problems.

There are some processes that are particularly vulnerable to cutbacks in natural gas because only a gas fuel can be used. What kinds of contingency plans have been developed for these operations?

Leibson: The processes that are most vulnerable would be those that use a lot of fire polishing in finishing operations. At this time, we do not

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IN THE GLASS INDUSTRY

(Continued from page 9)

panels of clear glass separated by a dry air space, with the entire unit hermetically sealed. The metallic reflective coating is applied to the inner surface of the outdoor glass panel.

On a typical summer day, the window units will reportedly reduce the peak solar heat gain on a building's sunny elevations by about 86%, compared with conventional one-eighth inch clear glass. They transmit 17% of the outdoor visible light and reflect 57%.

O-I Promotes Home Canning

Owens-Illinois has initiated a public relations program for its Magic Button home canning supplies. Target of the promotional effort is the nation's 30 million-plus home canners.

Aimed at educating consumers about correct home canning procedures, the PR program concentrates on key food communicators. Recipe features, news releases, and other home canning materials will be distributed to newspaper and magazine food editors, syndicate columnists, USDA Extension Service home economists, and supermarket consumer affairs directors. The TV and radio media will also be utilized, and ads will appear in several magazines.

Now in its second year of nationwide distribution, the home canning product line includes Magic mason glass jars, Magic Button mason lids, and metal and plastic rings.

Jubilee Exhibition of Hand-Engraved Glass

A major exhibition of engraved glass is to be staged by the Guild of Glass Engravers at Sanderson of Berners St. in London to commemorate the Queen's Silver Jubilee. The June 2-30 exhibition will be the first staged by the Guild in that city and will feature about 400 pieces of hand-engraved glass. Ranging from small table glasses to large window panels, it will also include many special Jubilee items. A large selection of the pieces will be for sale.

The wide variety of engraving techniques employed by the Guild craftsmen — diamond point work, steel point, copper wheel engraving, sandblast and flexible drive — will be well represented in the exhibition.

It is hoped to arrange for the art of glass engraving to be demonstrated during the show.

Corning Consolidates Canadian Sales

Canadian sales and servicing for all Corning, QVF and EIVS chemical process equipment and fluid transfer products have been assumed by Pegasus Industrial Specialties Ltd. of Toronto and Montreal. Previously, Corning's products were sold and serviced in that country by Pegasus and QVF Glass (Canada) Ltd., a Corning subsidiary. The move consolidates all Corning/QVF activities in Canada and phases out QVF Glass.

Pegasus' service capability includes local stocking and the ability to design and size packaged systems.

Glass Firms Help NYC School Set Up "Glass Museum"

With the help of such glass industry firms as Owens-Illinois, GE's Lamp Glass Products Dept. and Hamilton of Indiana, a grammar school in the New York City borough of Queens, P. S. 219, is planning a mini-museum that will depict the myriad uses of glass.

The children and staff of the school were inspired to undertake the project, which will be open to the public on June 1, as a result of a visit to Buckminster Fuller's recent exhibit at New York's Cooper-Hewitt Museum.

O-I has contributed industrial glass containers for the school exhibit, while Hamilton of Indiana has donated mirrors and GE, lamp globes. In an effort to make the exhibit as comprehensive as possible, Daniel Stein, museum director, is soliciting items from producers and sellers of various types of glass products. Anyone who would like to contribute should contact him at P. S. 219, 144-39 Gravett Road, Flushing, N.Y. 11367.

Energy Management

Continued from page 23

have the technology to use oil. We could use such fuels as propane or hydrogen, but they are very expensive. We do know how to solve potential problems in this area, but we don't feel our curtailment has reached the point where these processes will be in jeopardy in the next few years. Before we are exposed to such problems, we will have the technology to protect ourselves.

Can you give an example of a plant or division that has done an outstanding job of saving fuel?

Leibson: The greatest progress has been made in the Consumer Products Division, where they have made almost a 25% improvement in the efficiency of their total operations. This has been accomplished, in large measure, by conversion to electric furnaces, but they have also done a good job in reducing energy losses in other areas.

One thing that should be stressed is that many people don't comprehend the seriousness of the nation's energy problem. The energy crisis is real. Our gas supplies are extremely limited. We have to take energy conservation very seriously.

Do you feel it is possible to save more and more fuel each year by improvements in manufacturing techniques and better conservation methods?

Leibson: Obviously, there has to be an end, but there are a tremendous number of things we can do to reduce consumption. However, the majority of them are capital-intensive. Just to plow in millions of dollars to save energy without compensation on the other end would be the road to ruin. We have to be frugal in the way in which we apply capital to make sure the dollar savings are sufficient to pay us back for our expenditures. We have to have a good return on investment — this is the key. As fuel prices increase, however, the attractiveness of the investment improves. Over time, we feel we can apply more and more of our technology to conserve energy.

What can the average employee do to save energy on the job, other than turning out unnecessary lights and lowering thermostats?

Leibson: In the work environment, it is important that all of our employees be aware that energy is scarce and very expensive. Any place that they see waste taking place, they should take steps to reduce it or to call it to management's attention. Certain things like operating a fire-polish burner when the operation is shut down is wasting fuel. The burner should be turned off. This is the kind of thing of which all employees should be conscious. ■

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Engineering Manager, Auto Glass

Re: The Case of the Missing 30-Mesh Screens

Copies to:

We have a problem. Two days ago while inspecting the mixing room, I discovered that the 30-mesh screen required to sort out too coarse raw materials had been replaced with a much less fine screen. We all know how sensitive the float process is to variances in this area. It has been company policy for five years now to use 30-mesh screening.

I told the mixing supervisor of the problem. He mumbled something about having to live with lower grade soda ash and sand. Since I got no response from him, I went directly to the plant manager. The plant manager also said the larger screen was made necessary by the cheaper raw materials being purchased. I suspect the substitution of the screen is the cause of the imperfections on the glass surface we're struggling to correct in the forming unit. That may be why the machine changes we've tried have had no impact.

Since I'm getting nowhere with them, could you talk to the Plant Manager and the Director of Manufacturing and get some action?

A final point--the rejection rate off the auto glass line has gone from 2 to 6% in the past two months. I'm sure the screen is the cause of it.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Plant Superintendent, Auto Glass

Re: Product Development Interference

Copies to:

If you haven't heard by now, the Engineering Manager is on my back about our substituting larger screens in the mixing room than those required by company policy (which specifies the use of 30-mesh screens). He claims it is having an effect on quality. He even goes so far as to say it is causing the problem we're having in the forming area (the one Product Development has been working on). I think that's wrong. If the coarser materials coming through were causing quality problems, we'd be hit with the problem in the melting area.

He has to be made to understand that we've significantly reduced the cost of raw materials by buying cheaper grades of sand and soda ash. If we put the 30-mesh screen on, half of the stuff wouldn't get through.

Why can't they just be pleased with the fact we've reduced the cost of raw materials in the past year from 34 to 29% of total production costs?

Can you help out?

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Director of Product Development, IGD

Re: Current Department Projects

Copies to:

PROJECT	STATUS	DEADLINE
1. Revise coating process of microwave oven windows (insufficient coating)	Project team formed and alternative process outlined	Recommended solution in four weeks
2. Machine change: Auto Glass forming unit (flecks in glass surface)	Team formed; research underway	Two weeks until recommendations
3. Current infraction of waste emission standards (Specialty Glass Plant)	Project team formed, data being collected	Six weeks until recommendations
4. Frost-free auto windows--apply technology of aircraft windows in cost-effective way	Project team being formed	Six-eight months until prototype system developed

LOOKING GLASS
Industrial Glass Division

To: File

From: Director of Product Development, IGD

Re: Status of Product Development in Industrial Glass Division

Copies to:

Over the past year:

1. A major accomplishment was getting the Division's blessing to start a promising new technology extension project, making frost-free auto windows.

2. Budget decreased by 10% over last year. It could be worse. In the Commercial Glass Division, the decrease in absolute dollars has gone on for over five years. For our division, at least, this is a new phenomenon.

3. Have to get the Division to allow me to hire professionals, not left-over line managers.

4. The Vice-President seems to have no appreciation for the role of Product Development in this division. I must write a memo to the Vice-President stating why what we do matters, even though I can't always put it in P & L form.

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Plant Superintendent, Glass Piping

Re: 80/20 Problem

Copies to:

DIR-S&M, IGD

While I haven't yet seen the latest income statement for the division, I expect there will be some bad news for our plant. Sales will have gone up dramatically, while net income will have dropped. A major reason for this is the 80/20 phenomenon. That is, in many markets 80% of the sales can be accounted for by 20% of the clients. In order to increase net sales, our sales reps are bringing in many more small ($50,000-$100,000) orders. Because of the frequent changes in specifications to suit the small orders, our production process is shot to hell. Machine downtime has skyrocketed.

Our company has to decide if expanding sales at such a rapid rate is worth the cost. Why do we have to go after every small manufacturer of wine processing equipment across the country? Let's stop beating the bushes!

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Director of Manufacturing, IGD

Re: Today's Meeting

Copies to:

Let's meet at 10:00 in my office for our regular status report on your plant. One agenda item that I want us to cover is a wide ranging discussion of how to stabilize the profit picture at your plant. It's beginning to resemble a roller coaster!

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Director of Manufacturing, IGD

Re: Today's Meeting

Copies to:

I'm planning on our regularly scheduled meeting in my office at 11:00, and hope to keep the agenda quite open. The purpose is to bring me up to date on the progress and problems in your plant for the past two months.

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Secretary

Re: Reminder--Meetings

Copies to:

Meetings scheduled for today:

10:00 am - Plant Manager, Specialty Glass

11:00 am - Plant Manager, Auto Glass

Both are to be in your office.

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Director of Manufacturing, IGD

Re: Sales Practices

Copies to:

VP, IGD
PM-SPECIALTY

The Specialty Glass plant manager has told me of an incident with the salesperson from Region IV. Apparently a recent order from Majestic Appliances for oven windows was received in two shipments four weeks apart (100,000 units each time). As a result, two separate production runs had to be made, increasing production costs by at least 17%. The client, in talks with the plant manager, indicated he was pressured to make a commitment on the spot (that day happened to be the last day the salesperson had to meet quota). If the customer had been given seven days longer to place the order, all 200,000 units would have been ordered at once, plus the customer would have had to deal with a less high pressured sales pitch. Can't these sales practices be changed?

LOOKING GLASS

Industrial Glass Division

To: Those Listed

From: Vice-President, IGD

Re: Belt-Tightening

Copies to:

DIR-MFG, IGD
DIR-S&M, IGD
DIR-PD, IGD

I think Mallinckrodt has the right idea! I see our market possibilities as also having real uncertainty, and I think belt-tightening all around is called for. I want suggestions from each of you as to how you will effect cost-cutting in your area. It's good to stay lean.

Caution About the Outlook for 1978 Extends To Prospering Firms Like Mallinckrodt

By David P. Garino
Staff Reporter of The Wall Street Journal

ST. LOUIS – Harold A. Brinner, vice chairman of Mallinckrodt Inc., is fond of telling the story about the ironworker standing on a skyscraper who is asked the secret of his success. His terse reply: "don't get caught leaning the wrong way when the wind stops blowing."

Mallinckrodt, a specialty-chemical and pharmaceutical maker headquartered here, is taking much the same stance as the ironworker. Mallinckrodt has noticed a slowdown in its business and it doesn't aim to get caught leaning the wrong way.

Long known for holding a tight rein on costs, the company is being more strict than usual this year. For the first time, cost-reduction committees are being set up within each of the 18 divisions. More than 200 previously authorized job hirings have been rescinded and are being reevaluated—employment now stands at 4,300. And the word has been put out to employes to wait for WATS lines rather than dialing directly when WATS lines are busy.

At first glance, it appears incongruous that Mallinckrodt should be wary. The company recently reported that 1977 was its 15th consecutive year of record profits, with net income of $27.2 million, or $2.89 a share, up 12% over 1976 results. Moreover, in 57 of those years' 60 quarters, the company has turned in higher earnings than in the year-earlier periods. Sales also set a record last year, totaling $313.2 million.

But a look at Mallinckrodt shows that even some companies that are doing well, not just those in depressed industries, are viewing 1978 cautiously, despite a growing consensus among economists that the real gross national product will increase between 4% and 5%.

Watching Pennies.... ....

Not only is Mallinckrodt watching its pennies now. "If the economy doesn't grow as fast as expected, we'll tighten up even more," says Robert A. Clabault, president. He says that such attitudes by Mallinckrodt and other companies "will certainly have a snowballing effect, which would accelerate any economic downturn."

Mallinckrodt executives say their actions "are only what any prudent management would do." Their corporate alarms "started jangling" in last year's third quarter, Mr. Clabault recalls, as the pace of business wound down noticeably. (The third quarter was a record one, with sales and profits up 12.6% and 8.2%, respectively. But in the first half, sales and earnings had been up 17.9% and 18.7%, respectively.)

Mallinckrodt immediately took several "Band-Aid" measures such as trimming advertising expenditures and cutting back on attendance at conventions. "Those pennies, nickels and dimes add up to dollars," Mr. Clabault says. "We wanted to make sure we weren't on top of a toboggan slide."

There was no precipitous drop in business in the fourth quarter, but sales rose only 3.7%, while net income rose 6.1%, the smallest percentage gains of the year. This decrease in the rate of growth did little to dispel the company's caution, Mr. Clabault says. Nor was the executive cheered when he attended a meeting of the Manufacturing Chemists Association last November. "Everyone I talked to said business was pretty good, good or great, but everyone was nervous as a cat about 1978," he says.

A Feeling of Caution

Then, the first of December, Mallinckrodt's top management met for six days with some 70 or so department heads, division managers and other operating personnel. "There was a much greater feeling of caution expressed at the budget planning sessions than ever in the past," says Harold Thayer, chairman and chief executive. "There wasn't much confidence that price increases will stick," he adds, which of course makes the cost-price squeeze all the more severe. By and large, the company hasn't even tried to raise prices.

"Every day it gets harder to raise prices," says Mr. Clabault, the president. This means that to maintain profit margins, "you either increase sales or control costs. Thank heavens we don't make commodity chemicals." These are subject to intense price competition.

Commodity chemicals are general-purpose chemicals such as benzene, ammonia and caustic soda. Specialty chemicals, the kind Mallinckrodt makes, are designed for specific applications. For instance, Mallinckrodt produces stearates for the paper industry and catalysts for the petrochemical industry.

The chemical industry is expected to grow at a 5% clip this year, Mr. Clabault observes. "I think we can do a hell of a lot better than that," he says, "but it won't be a boom year. It's management's job to see that nothing falls out of bed."

Among other precautions, each division prepares a five-day sales and earnings forecast for top management. "We aren't going to wake up in the middle of a month and wonder what happened the month before," Vice Chairman Brinner promises.

Justifying New Employes

Mr. Clabault pledges "a very tight control of headcount" throughout 1978. "You'd be surprised how many people you really don't need when you take a second look." All new operating employes must be approved by President Clabault, all new administrative personnel by Vice Chairman Brinner. Taking on new employes "will require the same justification as capital projects," Mr. Clabault says.

Indeed, capital projects will be scrutinized more closely and must be "cost-justified," Mr. Brinner says. Capital expenditures this year should approximate $22 million to $24 million, compared with $26 million in 1977.

An especially critical eye will be cast at programs "which don't directly produce revenues," Mr. Brinner says. For example, a proposed expansion of data-processing capability "won't show up on the bottom line," he says, and it probably won't be implemented now. Renovation of a couple of floors at the company's downtown office and plant also will probably be postponed. "This is something we can do without for a while longer," Mr. Clabault says.

Mallinckrodt will also reevaluate its technical priorities. "One of the toughest things for any company to admit is that there could be a time to cut losses on a research project," Mr. Clabault says. "Not all research projects will lead to marketable products. If you boot home 25%, you're a superstar; 10% is good." Yet, he says, many a project "continues on its own momentum," eating up capital that could be used elsewhere.

Selective Cuts

Mallinckrodt's management, however, also recognizes the danger of "pursuing short-term gains to the detriment of future growth," Chairman Thayer says. Indeed, Mr. Clabault says, Mallinckrodt could slash research-and-development expenses this year and, as a result, "we could boost earnings per share dramatically and be a hero to shareholders. In four to five years, however, we'd be out sweeping the streets." Vice Chairman Brinner emphasizes, "One thing we've never done is to take a meat ax to our operations; cuts must be selective."

In fact, some technical people will be added to the specialty-chemical group in an effort to come up with improved products. And employes will be added in the flavors and fragrances businesses, which Mallinckrodt feels have better-than-average growth potential.

Mallinckrodt will sharpen its pencil when buying supplies, Mr. Clabault indicates. "There's always money to be saved by good purchasing practices," he says. "Our suppliers will find us firm, but fair." Translated, that means Mallinckrodt will do more shopping around, seeking, among other things, bigger discounts for quantity purchases.

A recently implemented computerized inventory system will help Mallinckrodt to keep inventories lean. And as an aid to boosting sales, Mallinckrodt is spending much time "on the care, feeding and motivating" of its sales force, Mr. Clabault says. For one thing, it is developing a new series of incentives for salesmen.

"While selling catheters and stearates isn't the same as selling autos," Mr. Clabault says, "incentives can work, and if you can get a salesman to get out of the sack at 6 instead of 8, he's going to sell a lot more."

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Vice-President, IGD

Re: Harvard Business Review article

Copies to:

I want to share with you my summary of an interesting article which contrasted sales vs. marketing executives that I read recently.

Sales executives focus on:

1. Sales volume rather than profits.
2. Short-run rather than long-run turns.
3. Individual customers rather than market segment classes.
4. Field work rather than desk work (e.g., completing sales forecasts).

Marketing executives focus on:

1. Profit planning: aim is to produce mixes (product, customer, and marketing) that achieve profitable volume and market shares.
2. Long-run trends, threats, and opportunities.
3. Customer types and segment differences.
4. Good systems for market analysis, planning, and control.

You've done admirably to create more marketing within the division, but I am worried by our lack of long-range market studies--what do you have on this, particularly in Glass Piping and in Auto Glass?

LOOKING GLASS

Industrial Glass Division

To: Those Listed

From: Vice-President, IGD

Re: Increased Capacity in Auto Glass

Copies to:

DIR-MFG, IGD
DIR-S&M, IGD
DIR-PD, IGD
PM-AUTO

I have just returned from discussions with two major foreign auto manufacturers (one in Japan and one in West Germany). Both have solid sales in the U.S. and are in the advanced stages of planning manufacturing sites in the U.S. They both indicated a real commitment to us as the sole supplier of windows and windshields. (They feel we have the greatest quality control amongst our competitors.) Both of their plants will be located on the West Coast.

We are now confronted with the problem of planning how best to develop these new sources of sales (they should quickly amount to between 25-30% of our existing auto sales). We are operating close to capacity in our existing plant.

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Sales Manager, West

Re: Increased Sales - Piping

Copies to:

The western sales district has just completed an encouraging first quarter of this fiscal year, and I'd like to review the accomplishments of my sales force with you:

1. In glass piping the western district achieved $1.7 million in sales. This is a 60% increase over the sales for the first quarter of last year, and has resulted in a 35% drop in our cost ratio (sales costs compared with sales completed).

2. Looking Glass now has a respectable market share of glass piping on the West Coast. Using the best data available, we now estimate that we have captured 22% of the market. This makes us the market leader, allowing us to dictate terms of sale much more than in the past. Please recall that five years ago we accounted for no more than 5% of the market for glass piping on the West Coast.

3. While the increase in sales in glass piping involves selling to relatively small manufacturers of wine processing equipment, we have achieved a visibility which now makes us attractive to larger clients. Our piping for Western Star Equipment (never a large account) has been so well received by their customers that Farron Inc. has initiated talks with our western district sales rep. If you remember, Farron is the leading domestic manufacturer of winery and dairy equipment (with about 30% of the market share). I'm convinced that the Farron contact is directly attributable to our success with the small Western Star contract.

I think our salespeople have done a superb job in putting Looking Glass on the map. This has been tough given the intense competition in glass piping. Our ability to reward such superior performance has me worried. I don't think that flat percent commissions reinforce the effort required to break into these markets. Is there an additional incentive we could offer our staff for entering new markets?

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Engineering Manager, Auto Glass

Re: Replacement Rate Analysis

Copies to:

As you requested on the attached memo, I've made an informal status report of our two production lines. They're combined because the status of their machinery is comparable.

I. MIXING ROOM--Machinery is 10-15 years old; expect major replacement in 2-3 years; breakdowns have increased in the past year.

II. MELTING and FORMING ROOMS--All machinery is 3 years old; life expectancy is 10-15 years, we have the bugs worked out; few breakdowns.

III. FINISHING ROOM--We've replaced some in the past year (the old equipment could not keep up with the output from the new float glass machinery in the melting room). Much of the equipment is very old (up to 20 years). We are experiencing many breakdowns now, as we are operating at more than full capacity.

With regard to your question on machine changes necessary to increase production by 25%, we need an entirely new production line. Our two production lines are already running at capacity. The plant would obviously have to be expanded to accommodate another line; this could be a real problem because of our inability to buy the neighboring piece of real estate.

Assuming we could get the property, we are talking about a total capital investment of $18 million. It would take 20-24 months to build the addition and install the machinery. We would need an additional 4-8 months to get the major bugs out of the system.

LOOKING GLASS
Industrial Glass Division

To: Engineering Manager, Auto Glass

From: Plant Manager, Auto Glass

Re: Machinery Status and Replacement Report

Copies to:

I need an estimate from you on:

1. The status of machinery on our two production lines.

2. What changes, if any, would we need to make to generate a 25% increase in production?

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Vice-President, IGD

Re: Increasing Production Versatility - Piping

Copies to:

In a recent conversation I had with the Director of Manufacturing, the issue of the versatility of the machinery in glass piping was raised. It seems there is increased demand for producing piping meeting different specifications. A memo should be arriving on my desk shortly documenting that need more clearly. In the meantime, I want you to outline for me how you and your staff might address the issue of increased production flexibility. Please send me your thoughts on the following by this afternoon:

1. How long would such a study take?

2. Who would be involved in the study? I'm thinking of a task force led by someone from your shop, but also including a Sales and Marketing representative, as well as someone from Manufacturing.

3. What kinds of data would you need? What would your plan of attack be?

4. How much staff time would be required?

5. What solutions could be offered?

The issue is critical to our division's profit picture. I look forward to your response later today.

LOOKING GLASS

Industrial Glass Division

To: President

From: Vice-President, IGD

Re: New Market--Auto Glass

Copies to:

I've just returned from my trip abroad during which I met with two foreign auto manufacturers (one in Japan and one in West Germany). If you remember from our previous conversations, both have solid sales in the U.S. (totaling 9% of auto sales with projections upward to 15% in the next three years). These companies are in the advanced stages of planning manufacturing sites in the U.S. on the West Coast.

I was able to get a strong commitment from the German firm to us as the sole supplier of windows and windshields, as they feel we have the highest quality control among our competitors. The Japanese firm was interested in us, but questioned whether we had the capacity to handle their orders. They would like, as soon as possible, more concrete data from us indicating how soon we could generate that additional capacity.

Both prospects look most appealing. As you know, our Auto Glass contracts have historically been most profitable. In the past fiscal year we had a net income of $3.5 million from a net sales of $57.8 million. Income should go up this year, as we continue to work out the bugs of our relatively new float glass process.

Time is of the essence on this one. Could I meet with you today to discuss the issue?

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Vice-President, IGD

Re: Deviation in Use of Natural Gas

Copies to:

In looking at accounting's review of gas and electric usage across your three plants, I'm struck by the substantial (50%) increase in natural gas usage in the Towson plant. I suspect it's due to some inefficient running of the equipment. I know we are still struggling with production problems on the aircraft window line, but this increase is unacceptable.

Check on this for me.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Director of Manufacturing, IGD

Re: Skyrocketing Natural Gas Usage

Copies to:

The Vice-President is on my back about the dramatic increase in natural gas usage, a 50% increase last year over the year before. It makes me wonder how seriously your staff took our guidelines of over two years ago for more energy-efficient use of the equipment. Let me know what you're going to do about this.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Plant Controller, Specialty Glass

Re: Monthly Report--Specialty Glass

Copies to:

In the past month my department has faced the following issues:

1. Lost our senior departmental secretary, Ms. Blumen. She served us capably for 31 years and will be sorely missed. Her replacement, Mr. Johnson, has not worked out well. I'm giving him six more weeks to shape up. The absence of Ms. Blumen has created some problem in expediting receivable accounts.

2. Worked with the Plant Superintendent to monitor more closely the overtime in the Finishing Shop. If you remember, we have had a 20% increase in overtime during the past two months. I suspect some cheating by several of the employees, with them getting friends to punch out for them. We are going to set up a monitor at the punch clocks around the end of the second and the beginning of the third shifts. I think this should end the problem, but the Plant Superintendent is not so sure. Could you ask him to cooperate with me?

3. I'm worried about our contract with Textro Industries for the supply of natural gas. I know we were desperate two years ago when Mid-Atlantic Gas kept cutting us off during those cold winter months, but I think signing a contract sharing gas from their private gas supply may have been a mistake. The escalator clause in the contract was used to justify the 38% increase in rates last year. This year they've already announced another 10% increase. If you remember, the price we pay is dictated by the wellhead price being paid for intrastate use of the gas in Texas (the source of our natural gas).

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Personnel Manager, Specialty Glass

Re: Real Estate

Copies to:

A close friend of mine, Ed Bradley (he was part of our foursome the last time we played at the club), is with Millinium Realty. He informed me that they are handling a 20-acre plot directly behind the plant. The farmer who owns the land is retiring and moving to Florida, and is dividing his farm up into several plots. These 20 acres are zoned for agricultural purposes.

I bring this up because of our recent conversation about possible plant expansion. Do you want me to refer Ed to you?

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Plant Superintendent, Specialty Glass

Re: Personnel Policies

Copies to:

Harry Bates, one of my best supervisors (in the Finishing Room), recently fired John Jenkins, a 20-year employee, because he caught John drinking on the job. John came to me afterward to ask for his job back and to explain what was wrong. Apparently his wife walked out on him and he's been pretty down about it so he started drinking. He's sworn off it now. I had to back up Harry, so I told John I'd stick by Harry's decision. Doesn't Looking Glass have a policy to deal better with these problems? The men on the shop floor are hopping mad about John being canned. I asked our Personnel Manager what the company could do for John, but he didn't have an answer.

LOOKING GLASS

Industrial Glass Division

To: Listed Below

From: Vice-President, IGD

Re: Reorganization

C O N F I D E N T I A L

Copies to:

DIR-MFG, IGD
DIR-S&M, IGD
DIR-PD, IGD

After reviewing the recent performance of the Specialty Glass and Glass Piping factories, I must ask whether the two should be collapsed into one factory, either at Towson or Lynchburg.

My reasons for combining the two are:

1. Economies of scale: We've been particularly burned lately in buying relatively small quantities of soda ash and salt cake. For example, we paid 28% more for soda ash at the Lynchburg plant than we did at the Auto Glass plant, which orders five times as much.

2. Insufficient use of capacity: Recent figures (see IGD-28) speak for themselves.

3. Reduction of transportation costs: The Towson plant currently makes a substantial amount of the borosilicate glass used in glass piping insulation. By combining the two plants, this cost could be eliminated.

I know there would be some significant problems by such reorganization, but none seem terribly overwhelming to me now. Give me your thoughts on these issues: cite pros and cons from your point of view; indicate where you think the plant should be located, and how it should be organized. Try to keep in mind the best interests of the whole division when you make your recommendations.

I do not want word of this to go out to your staff. We all know what destructive rumors can do.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Engineering Manager, Specialty Glass

Re: Vandalism

Copies to:

In the past month two of our employees on the third shift have had their cars broken into in our parking lot. In both cases valuables were stolen. Our strategy up until now has been to avoid a fence and guarded entrance; instead, we have had one of our maintenance staff (a husky fellow) make rounds every hour during the third shift. I know he does this conscientiously (perhaps too much so--he keeps a rigid schedule of going out every hour on the hour).

While you are at headquarters, perhaps you could ask the other plant managers what they do to prevent this problem. I have some ideas, but they are all fairly expensive and don't fit into your emphasis on cost reduction.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Specialty Glass

From: Plant Controller, Specialty Glass

Re: APD and Glass Blanks

Copies to:

I am responding to our conversation regarding the plant manager of Integrated Circuits in APD trying to cut off our supply of aluminosilicate glass blanks (for spacecraft windows) and borosilicate blanks (for oven windows). I've checked out some of your questions and have come up with the following:

1. Yes, the price of silicate has gone up, although not by 20%; it's more like 13%.

2. The cost of goods sold is also likely to have increased because of their greater labor costs. APD in general has trouble holding down costs in that area.

3. Their estimate of $38,000 is reasonably accurate. Given our current facilities (which, you remember, are not as technically advanced), it would have cost us about $52,000.

4. Outside sources are not easily available at a reasonable price. The closest I could come was an estimate from G & S Glass, which came in 24% over the price we currently have with APD.

5. APD supplies 30% of the glass for our oven windows, and 62% of the glass for the spacecraft windows.

In summary, we need their glass. Couldn't you get the Vice-President to put his clout behind us on this one? Our profit picture depends substantially on keeping their cheap, reliable source of this highly specialized glass.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Personnel Manager, Auto Glass

Re: Employment of Minorities

Copies to:

By now Corporate Personnel must have released the final figures on employment of minorities. While the data on our plant may not look good at first sight, let me give you some additional information to help you interpret the statistics:

(1) The incidence of female hourly employees shot up from 20% last year to 28% this year. Last year we also got our first black manager. He is performing superbly.

(2) The guidelines I hear bandied about for the employment of minorities don't make sense in the Findlay area. Of the residents in a 40-mile radius of our plant, only 8% are black or Chicanos. It's unfair to compare us with the Towson plant, which is outside of Baltimore.

(3) Our problem is that minority candidates don't apply to us for jobs, particularly for professional level openings.

As you can see, the numbers reflect some real progress made in the direction of hiring women and minorities. They also reflect the small number of minority individuals living in our part of Ohio.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Personnel Manager, Auto Glass

Re: Problem with Woman Supervisor

Copies to:

In following your directive, I've encouraged women to apply for supervisory positions. Mary Briggs, one of the two female supervisors, has been having difficulty because her subordinates, all of whom are men, resent her being their boss. They constantly joke with her about taking orders from someone in a skirt, and tell lewd jokes in her presence. I've seen this happen several times. Mary is not terribly assertive in her dealings with people, and her subordinates are getting the best of her. She seemed to get off to a good start on the job. It was after she fired someone, eight months into the job, that the men started harassing her.

I have worked with Mary. I even sent her to an "Assertiveness Course" at Findlay Community College. The only effect that course seemed to have was allowing her to tell me what a lousy course she thought it was.

Quite frankly, I've given up on improving this situation. I recommend that we transfer her to another plant, and I've talked to her about Towson. Mary said she wouldn't mind moving to the Baltimore area. Should I contact Specialty and see if they have a place for her?

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Plant Controller, Auto Glass

Re: Soda Ash Crisis

Copies to:

We have a crisis on our hands! The rep at Mountain Minerals, Inc., our supplier of soda ash, just called to tell me they won't be able to process any more soda ash for the next four weeks, because somebody dynamited all their mining equipment last night. Because it is so specialized, it's highly unlikely they will be able to get it replaced before four weeks, if then. We currently have a 6-day supply (at 150 tons per day).

The only viable option seems to be to borrow from the other divisions. I'm sure the Commercial Glass Division has surplus. By the way, it would be best for us to get the soda ash delivered by train. Our storage silos hold only a 3-day supply.

B-1
B-4

IGD-57
(APD-111)

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Vice-President, IGD

Re: Auto Glass Study

Copies to:

DIR-MFG, IGD

Our Auto Glass plant has become profitable, but I'm worried about running so close to capacity given the age of some of the machinery. I would like a 10-year projection of equipment needs for that plant.

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Plant Superintendent, Auto Glass

Re: Sloppy Practices by Engineering Staff

Copies to:

The past two visits by OSHA inspectors have produced two embarrassingly obvious infractions by members of the engineering staff. During the first visit, the OSHA inspector literally tripped over a tool box left behind by one of the maintenance staff. During the second visit, an engineer was not wearing his hardhat in a clearly designated hardhat area--again the inspector noticed. We are having enough trouble with OSHA on major issues like temperatures in certain working areas, and we don't need stupid blunders such as those made by the engineering group. I've talked to the Engineering Manager, but Bill didn't do anything. Just today I saw some more tools left by the maintenance staff in front of a doorway. Will you handle this?

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Engineering Manager, Auto Glass

Re: Creative Engineering

Copies to:

Some good news! Bill Thorton, an engineer in my group, has perfected a new finishing process which (1) reduces by 30% the use of chemicals, and (2) increases quality of the final glass product. Bill did it all on the side. It was not even assigned to him--he's been doing some problem solving involving packaging. I don't have many ways to reward him, except to give him a pat on the back, as my merit bonuses for the year are all used up. I would appreciate it if you could stop by and congratulate him yourself.

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Sales Manager, Midwest

Re: Rejected Shipment

Copies to:

Miller Motors just called and told me they are not accepting the latest shipment of 800 tons of blanks (worth $350,000) for their auto windows since they have completed production of the current year models. Apparently, their sales dropped precipitously in the past few months, so they shut down production for this model year three weeks early. They say they can't use the glass in next year's models because the chemical composition has to change (to comply with more stringent federal regulations).

Miller Motors is our oldest and largest consumer for auto glass (32% of our auto glass sales this year). This kind of thing has never happened before.

They are clearly violating their contract, which they sign on an annual basis, committing themselves to a minimum purchase for that period. Their year is now up and they did not make the contracted amount of purchases.

What can we do?

(1) We can remind them of their contract, and threaten legal action if they don't accept the shipment. Legal at Corporate has said we have an open-and-shut case.

(2) We can attempt to sell the glass, greatly discounted, to another auto manufacturer.

(3) We can turn the glass into cullet.

I would suggest we pursue No. 2, but await word from you.

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Marketing Research

Re: Truck Glass Possibilities

Copies to:

Our task force on sales possibilities for truck windows and windshields yielded the following:

(1) Tonnage carried by U.S. carriers is projected to increase 8-10% annually for the next 7 years.

(2) Federal and state legislation is in process that would decrease the maximum allowed weight of a loaded truck.

(3) Trucks used by major interstate transit lines are run at their limit. The average truck is on the road 9.5 hours during a typical day. Most experts believe that represents maximal usage.

(4) The truck window and windshield market is split among eight suppliers. No supplier holds more than 20% of the market. Looking Glass is, of course, not included in that group. (I still don't understand why that fateful decision was made not to enter the truck market twenty years ago.) For most of our competitors the truck glass market generates juicy profits.

(5) The truck manufacturer market is more fragmented than auto (8 producers versus 3). One encouraging bit of news is that four manufacturers account for 80% of truck sales.

(6) To make an impact on the market we should probably focus on high quality rather than price. Truckers seem to be attracted to comfortable, well-built cabs, and price is secondary. If the windshields, for example, could incorporate an instant defroster, we would have a winner. Product Development might have some other good ideas on how to make our product unique.

(7) If we could capture 10% of the market, we could generate $20 million in sales.

I've gone about as far as I can with this project. Will you be reviewing this with the VP soon? In anticipation of our moving in this direction, I've bought a CB unit--we'll have to learn their language!

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Director of Sales and Marketing, IGD

Re: Cozy Relationship with Clients

Copies to:

I have been following some of the sales tactics used, particularly by the sales manager for the Midwest, Charlie Bidwell. Specifically:

(1) Logs for our corporate jet indicate that in the past month he took (on separate occasions) representatives from two of our major auto customers to Southern Pines, North Carolina, on unspecified business.

(2) He has twice allowed representatives of these same two customers to use his 35-foot sloop (docked in Annapolis) for vacations. The boat apparently was stocked with booze and food.

Charlie has done a superb job holding our market share in auto glass. He is one hell of a salesman, and has his staff behind him 100%. However, I am worried that his tactics are becoming unethical, if not downright illegal.

I would like a meeting with you at your earliest convenience to resolve this issue.

LOOKING GLASS

Industrial Glass Division

To: Listed Below

From: Plant Superintendent, Glass Piping

Re: Expansion Trouble Shooting Task Force--A Postmortem

Copies to:

DIR-MFG, IGD
DIR-S&M, IGD
DIR-PD, IGD

I want to give you my opinion of the Expansion Task Force created three months ago. It consisted of a Product Development engineer from Corporate, as well as three representatives from my plant (production control, manufacturing, and engineering). The problem we faced was a malfunction of the production process in making insulation precisely at the point where the foaming agent is mixed with the cellular glass. At this point the compound should expand 8-10 times. We often had expansion of only 4-5 times the original amount. The problem was unresponsive to many different changes in heat, composition of raw materials, etc.

Well, the task force never got off the ground. It appeared to me that Jane Hanson, the PD representative chairing the task force, quickly took sides, immediately jumping on the manufacturing representative. He clearly did not have his "day in court," and stopped attending after several meetings like this. I can't blame him, as I think his position was reasonable. I thought these PD people were supposed to be "facilitators"--Jane was more of an "obstructor."

By the way, in the meantime the expansion problem has rather mysteriously disappeared. I see no need to resurrect this task force.

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Vice-President, IGD

Re: Packaging

Copies to:

DIR-S&M, IGD

I enjoyed our conversation today about developing new technologies for packaging some of our more difficult items (like piping and specialty windshields). We surely have a problem with breakage, particularly for items like piping, which has a breakage rate of up to 10%. The present combination of cardboard and wooden frames makes for a bulky and heavy container, which results in high freight shipment costs, particularly to the West Coast. What we need is a light, durable cover that hugs and cushions the piece of glass.

We have come up with the idea of a plastic bubble which completely surrounds the glass. (You indicated our neighbor down the road, American Plastic, is experimenting with such a process.) Why don't you sketch out some ideas on a possible PD-directed project in this area? Start with exploring several possibilities in addition to the plastic bubble notion. Also, figure out if this covering could somehow be made in-house. As usual, I would like all of the specs you normally include in any PD proposal.

I think you're on to some good ideas, so let's push them a bit further.

I've copied the Director of S & M and expect Sales and Marketing to help you (1) pinpoint breakage problems and (2) determine if there could be an outside market for our new product.

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Vice-President, IGD

Re: Microwave Oven Windows--A Look at the Future

Copies to:

I'm pleased with the substantial inroads we've made in the microwave oven area. The development by your group of a low-cost, high-quality window is one reason we're sitting comfortably in this market. While I was talking to the President of High Point Industries yesterday (still our major customer in this area), he indicated that they are planning a whole new generation of microwave ovens to be introduced into the market in about three years. A part of the changes planned will involve windows of different specifications. Let's get on top of this situation and chat about this today before I forget the details of the conversation. It's time for some long-range planning.

LOOKING GLASS

Industrial Glass Division

To: File

From: Vice-President, IGD

Re: Notes on Conversation with President of High Point Industries

Copies to:

- Arranged my visit to his plant for the 14th of next month; plan to stay an additional day to join him for golf.

- There are no major problems with our windows for his microwave units. Delivery is on time; he is a bit upset about breakage, and even though they get reimbursed, it is costly for them (additional labor).

- They are planning an introduction of a new generation of microwave ovens within three years.

  Characteristics:

  - lower cost
  - more compact
  - greater window area (not sure why)
  - more energy efficient
  - large display units on window (to show things like # minutes before food is finished) using the technology of aircraft window display units
  - portable units

- I should talk to the Director of Product Development and get PD moving on this.

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Project Manager, Project Deepsea

Re: Progress Update

Copies to:

Our Project Deepsea has again run into snags. We've already spent $3.5 million over the past two years and are now stuck at the point of manufacturing a small number of prototypes. The specifications for developing this high-stress glass for use in submarines and sea labs are unreal. They make our specifications for the recent space-shuttle windows look like kids' play. Our staff (some of the brightest in our division) have tried their damndest! Here are some problems we haven't solved:

1. The use of so many rare materials in the glass puts us way out of line in terms of cost specifications.

2. The technology for producing this type of glass is about five years behind us (so say the last three expert consultants we've brought in).

3. Our stress tests indicate the type of glass needed for submarines is vastly different from that required for sea lab vehicles. There is no way we can meet both needs.

4. We're unsure about the potential market for this. If the Navy is supposed to be so interested in this effort, why haven't they sponsored our R & D efforts? I'm beginning to respect their wait and see attitude.

I know this is the President's pet project, and that the President wants to impress the Navy with our technological prowess, but I think this is a dead end alley. I would recommend immediate review of the viability of this project at the highest levels.

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Plant Superintendent, Glass Piping

Re: A Public Relations Problem with the Almighty

Copies to:

PM-AUTO
PM-SPECIALTY

Here's one for you! Next Friday I am meeting with several ministers representing a large number of Lynchburg area evangelical congregations. It seems their parishioners (many of whom work for us) have told them we manufacture piping used in the making of various alcoholic products. I've been told the ministers are quite indignant about this and plan to ask me to stop making such piping. If we won't stop, they will preach against working at Looking Glass. Being a transplated Yankee, this is all quite new to me.

I do have a plan of action for next Friday, but I wanted to check with you for suggestions.

LOOKING GLASS
Industrial Glass Division

To: Listed Below

From: Director of Sales and Marketing, IGD

Re: Quarterly Sales Report

Copies to:

VP, IGD
DIR-MFG, IGD
PM-AUTO
PM-SPECIALTY

Attached is a summary of the division's latest quarterly sales. For the division as a whole, sales have shown a solid increase (14%) over the same quarter last year.

Auto Glass sales were 2% above forecast, largely due to an order from American Auto to provide glass for a new economy car they are introducing.

Specialty Glass is 15% below forecast, due largely to an unexpected belt-tightening move by the federal government. The aircraft and microwave oven markets continue to show solid improvements.

The Glass Piping market is expanding far beyond forecasts. We have made solid inroads selling to wine and soft drink processing equipment manufacturers, particularly on the West Coast.

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

AUTO GLASS

SALES REPORT
(In Thousands)

	SAME QUARTER LAST YEAR		LAST QUARTER			
CUSTOMER LIST	FORECAST	ACTUAL	FORECAST	ACTUAL	VARIANCE	PERCENT OF TOTAL SALES
Miller Motors	$4,815	$4,913	$4,960	$5,080	+2%	32%
American Auto	3,872	4,400	4,490	4,971	+11%	31%
Furman Motors	3,410	2,963	3,471	3,205	-8%	20%
Miscellaneous	1,201	2,174	2,691	2,619	-3%	17%
TOTAL	$13,298	$14,450	$15,612	$15,875	+2%	100%

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

SPECIALTY GLASS

SALES REPORT
(In Thousands)

	SAME QUARTER LAST YEAR		LAST QUARTER			
CUSTOMER LIST	FORECAST	ACTUAL	FORECAST	ACTUAL	VARIANCE	PERCENT OF TOTAL SALES
Majestic Glass	$381	$421	$410	$418	+2%	11%
Military	834	1,685	2,313	1,750	-32%	46%
Apex Ovens	194	211	289	304	+5%	8%
American Appliances	208	246	356	381	+7%	10%
Bennington Aircraft	520	737	744	685	-8%	18%
Miscellaneous	142	211	276	266	-3%	7%
TOTAL	$2,279	$3,511	$4,388	$3,804	-15%	100%

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

GLASS PIPING

SALES REPORT
(In Thousands)

	SAME QUARTER LAST YEAR		LAST QUARTER			
CUSTOMER LIST	FORECAST	ACTUAL	FORECAST	ACTUAL	VARIANCE	PERCENT OF TOTAL SALES
Excello Equipment	$729	$740	$906	$918	+1%	18%
Dairy Systems, Inc.	585	633	804	816	+2%	16%
Western Star	329	291	340	306	-11%	6%
Midwest Machines	301	365	371	408	+10%	8%
Bottling Systems, Inc.	720	746	705	816	+16%	16%
Miscellaneous and Independents	895	1,025	1,320	1,836	+39%	36%
TOTAL	$3,559	$3,800	$4,446	$5,100	+15%	100%

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Plant Superintendent, Glass Piping

Re: Cost of Goods Manufactured

Copies to:

VP, IGD

Attached is the latest quarterly report on Cost of Goods Manufactured by Glass Piping. Our total costs are 7% above budget. The increase reflects unexpected utility cost increases and inefficient use of raw materials and labor due to an influx of small orders requiring frequent changing of specifications.

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

GLASS PIPING

COST OF GOODS MANUFACTURED

LAST QUARTER
(In Thousands)

	BUDGET	ACTUAL	VARIANCE	% OF MFG. COST
DIRECT RAW MATERIALS	$ 828	$ 888	+7%	22%
DIRECT LABOR	1,127	1,228	+9%	31%
VARIABLE OVERHEAD utilities and benefits	897	996	+11%	25%
FIXED OVERHEAD depreciation, taxes, rent, allocated overhead	874	862	-1%	22%
TOTAL	$3,726	$3,974	+7%	100%

	STANDARD	CURRENT
FINISHED GOODS INVENTORY LEVEL	30 days	23 days

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Plant Manager, Specialty Glass

Re: Cost of Goods Manufactured

Copies to:

VP, IGD

Attached is the latest quarterly report on Cost of Goods Manufactured by Specialty Glass. Our total cost was up 5% above budget. We are pleased that our efforts to cut down fixed overhead have paid off. Our variable overhead is well beyond acceptable limits, due to increases in natural gas fees. Steps are being taken to remedy this overrun.

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

SPECIALTY GLASS

COST OF GOODS MANUFACTURED

LAST QUARTER
(In Thousands)

	BUDGET	ACTUAL	VARIANCE	% OF MFG. COST
DIRECT RAW MATERIALS	$ 989	$ 973	-2%	32%
DIRECT LABOR	1,035	1,099	+6%	36%
VARIABLE OVERHEAD utilities and benefits	421	511	+21%	17%
FIXED OVERHEAD depreciation, taxes, rent, allocated overhead	437	432	-1%	14%
TOTAL	$2,882	$3,015	+5%	100%

	STANDARD	CURRENT
FINISHED GOODS INVENTORY LEVEL	30 days	38 days

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Plant Manager, Auto Glass

Re: Cost of Goods Manufactured

Copies to:

VP, IGD

Attached is the latest quarterly report on Cost of Goods Manufactured by Auto Glass. Our total cost was within 3% of budget, well within normal variance limits. Substantial savings have been achieved in raw materials. Both labor and utilities are above expected and reflect a quality control problem.

LOOKING GLASS

INDUSTRIAL GLASS DIVISION

AUTO GLASS

COST OF GOODS MANUFACTURED

LAST QUARTER
(In Thousands)

	BUDGET	ACTUAL	VARIANCE	% OF MFG. COST
DIRECT RAW MATERIALS	$3,475	$3,185	-9%	29%
DIRECT LABOR	3,257	3,623	+11%	32%
VARIABLE OVERHEAD utilities and benefits	1,943	2,162	+11%	19%
FIXED OVERHEAD depreciation, taxes, rent, allocated overhead	2,171	2,185	+1%	20%
TOTAL	$10,856	$11,155	+3%	100%

	STANDARD	CURRENT
FINISHED GOODS INVENTORY LEVEL	30 days	21 days

LOOKING GLASS
Industrial Glass Division

To: President

From: Vice-President, IGD

Re: Net Income for Last Quarter

Copies to:

DIR-MFG, IGD
DIR-S&M, IGD
DIR-PD, IGD
PM-AUTO
PM-SPECIALTY

LAST QUARTER
(In Thousands)

	Net Sales	Net Income	Income (% Sales)
Auto Glass	$15,875	$2,245	14%
Specialty Glass	3,804	(274)	-7%
Glass Piping	5,100	258	5%
DIVISION	$24,779	$2,229	9%

PREVIOUS QUARTER
(In Thousands)

	Net Sales	Net Income	Income (% Sales)
Auto Glass	$14,450	$1,156	8%
Specialty Glass	3,511	62	2%
Glass Piping	3,800	88	2%
DIVISION	$21,761	$1,306	6%

This has been a quarter of solid growth in Auto Glass. Both Specialty and Piping have shown a marked drop in income.

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Vice-President, IGD

Re: Rising Manufacturing Costs

Copies to:

Last quarter's Cost of Goods Manufactured report for the Specialty Glass plant revealed some unfortunate variances. The variable overhead was 21% above budget. While I'll be speaking to the manufacturing people about this, I'd also like your input. I know you and your staff have worked closely with manufacturing on some key projects in that plant. By the way, if you don't feel you have enough information regarding production costs in Specialty Glass, please see me and I'll provide you with enough to allow you to make a reasoned recommendation. Time is of the essence here!

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Vice-President, IGD

Re: Marketing Emphasis

Copies to:

I just read the President's memo to you concerning the Coordinated Sales Program. I want you to know that I raised this particular issue in the Management Committee because I sense a possible leaning toward APD and their needs in terms of overall corporate marketing strategy. I want you to be a forceful advocate of IGD needs and interests in this ad hoc group. Before you meet with them, please give me a briefing outlining the strategy you plan to take.

LOOKING GLASS

Industrial Glass Division

To: File

From: Vice-President, IGD

Re: Marketing Issues

Copies to:

In today's Management Committee meeting the Vice-President of APD presented plans for marketing the line of optical fiber products. The plans are ambitious and received the President's warm support. If IGD or CGD are to get active corporate support for marketing new products, we had better raise the issue of a larger corporate-wide investment in marketing. I'm particularly worried about the glass piping line being bypassed.

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Sales Manager, West Coast

Re: APD vs. IGD Service Terms

Copies to:

I've just run into a problem--one you ought to know about. Yesterday I called at Bentley Aerospace, the company that is in advanced stages of planning a new supersonic bomber. They are about to let bids for the windshields (a total of 30 square feet per plane). When I expressed an interest in submitting a bid for Looking Glass, my contact at Bentley insisted that we provide an unlimited free maintenance contract as part of the bid. He indicated that APD provides such a service when selling them integrated circuits. Since when has Looking Glass become so generous? We have never given such blanket service in IGD, so why does APD give better terms?

Can you resolve this issue for me? The Bentley contract could do much to help the fluctuating Specialty Glass sales.

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Vice-President, IGD

Re: Security Regulations - An Update

Copies to:

In yesterday's Management Committee meeting we reviewed the procedures for protecting our production secrets regarding both technology and formulas. Given the episode of two years ago in the Specialty Glass plant, we must remember to be constantly on the alert. I still don't understand how two of our competitors' technicians were allowed to view the complete production process for the new microwave oven windows. At any rate, the new regulations take place immediately and replace the existing code. They are:

1. No cameras are permitted in any plant without written authorization from my office.

2. No outside glass professionals are allowed in production areas without written authorization from this office.

3. All suppliers, customers, and other outsiders needing access to production areas will be carefully screened and must sign a confidentiality agreement.

4. Any breach of security rules will be prosecuted.

I want to be informed of your strategies to implement this new policy.

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Sales Research Staff

Re: Breakage Figures Information

Copies to:

This memo is in response to your request for more data on breakage figures for our three product lines. Working with the Controller's group, we came up with the following estimates for the past fiscal year:

	% of Delivered Goods
Auto Glass	2%
Specialty Glass	3%
Glass Piping	10%

These figures support our earlier argument that Glass Piping needs to clean up its packaging act. Their high breakage rate is causing some uncomfortable situations for our people in the field.

In order to see if Glass Piping was underinvesting in the packaging area, we calculated packaging costs as a percent of total production costs, as follows:

Auto Glass	9%
Specialty Glass	7%
Glass Piping	12%

As you can see, Glass Piping is not scrimping on packaging. It may be that packaging of glass piping (quite a delicate operation) requires a whole new concept.

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Director of Product Development, IGD

Re: Bonus Nomination

Copies to:

Bill Summers, Project Director of the effort to deal with infractions of waste emission standards, has personally created a breakthrough regarding liquid emissions. I anticipate receiving his report next week. I would like you to allocate $2,000 for a bonus to reward Bill's superb efforts.

LOOKING GLASS

Industrial Glass Division

To: Plant Superintendent, Auto Glass

From: Melting Supervisor, Auto Glass

Re: Personnel Reduction Success

Copies to:

PM-AUTO

When we introduced the float process machinery three years ago, we set a target of 30% fewer hourly workers in the melting room. While we had to hire twenty extra workers during the first few months after the machinery was installed, we have now reduced the number beyond that targeted. We have reduced the number of hourly workers by 48% as compared to three years ago. I'm pleased to have gotten us down so far, as I remember this was one of two objectives you set for me at that time.

While we've had to lay off a fair number of workers to reach this goal, they've gone fairly quietly, and I was able to focus on workers with only a few years at Looking Glass.

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Director of Manufacturing, IGD

Re: Plant Manager, Specialty Glass

Copies to:

The plant manager of Specialty has written me expressing interest in the open position managing the proposed Capacitors plant. I support this idea wholeheartedly and ask for your support also. Given the possibility of merging the Glass Piping and Specialty plants (as suggested in your recent memo), it would be wise to select a manager with loyalties to neither of the existing plants. A move of the Specialty Glass plant manager to another division would be most convenient at this time. I must say that the recent spotty performance of Specialty Glass makes me wonder if the plant manager might not serve the company better in another division.

LOOKING GLASS

Industrial Glass Division

To: Director of Product Development, IGD

From: Research Specialist

Re: Japanese Competition Invading Our Shores

Copies to:

The Yoshuba Glass Company of Japan has opened a manufacturing site in Sunnyvale, California. They are making predominantly TV tube casings for West Coast distribution. What makes them particularly interesting is a new float process they've developed and applied to auto glass in Japan. I understand they hold the lion's share of the auto glass market in Japan. Today they announced a planned expansion of product lines at their California site to include auto glass. Their improved float process should allow them to sell auto glass products at 5-7% less than Looking Glass.

LOOKING GLASS

Industrial Glass Division

To: Director of Sales and Marketing, IGD

From: Marketing Specialist

Re: Projected Foreign Auto Sales

Copies to:

I've just read the latest issue of a respected auto industry periodical which suggests that the major U.S. auto manufacturers plan to aggressively invade the market traditionally served by the West German and Japanese imports. All feel they are on the verge of some major engineering breakthroughs, allowing for increased gas mileage of between 25 and 45%. This, combined with a strong buy-American advertising attack, should reduce the foreign autos' share of the domestic auto market within the next 3 to 5 years.

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Director of Sales and Marketing, IGD

Re: Reorganization

Copies to:

In response to your memo on reorganizing (IGD-52), let me say that I welcome this discussion. Product lines from both plants have given us trouble from a sales point of view. As you know, an increasing percent of our sales is to West Coast customers, for both specialty glass and glass piping. The customers for the aircraft and piping product lines are located predominantly on the West Coast. Two problems have doggedly followed us in serving these two markets: high transportation costs and long delivery lead times. Customer relations could be dramatically improved if at least these two product lines were combined in a new West Coast manufacturing site.

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Director of Manufacturing, IGD

Re: Reorganization

Copies to:

Your memo (IGD-52) addresses an important problem facing our division. Before citing pros and cons of collapsing the two plants, I would ask if we could obtain information on the following questions:

(1) How much of a capital investment would be required at either site to incorporate all product lines? How much would this investment tax our corporate resources?

(2) What would the proposed collapsing save in the way of transportation costs (for borosilicate glass)? What percentage of cost of goods manufactured does this represent?

(3) What would be the direct and indirect costs of moving either plant (personnel, equipment, etc.)?

Neither my staff nor I have answers to these questions. It would help our thinking if the Controller's office could be brought in to present some hard data. Let me know if we can be of any further assistance in this matter.

LOOKING GLASS

Industrial Glass Division

To: Director of Manufacturing, IGD

From: Vice-President, IGD

Re: Alternative Energy Sources

Copies to:

The Vice-President of APD recently shared with me some background memos on the issue of energy sources. I found these thoroughly researched and of potential use in our analyzing variances in energy costs for all three of our plants. The recent increase in utilities costs at Glass Piping requires some action. The attached memos should help you form a recommendation.

LOOKING GLASS

Advanced Products Division

To: Director of Manufacturing, APD

From: Director of Product Development, APD

Re: Analysis of Energy Forms

Copies to:

In response to your request, some glass manufacturers are conserving energy by using more efficient ovens during the melting process. Since natural gas is a diminishing resource, as is oil, many companies are changing to electric. For example, National is changing to all-electric ovens and furnaces which can operate at three times the efficiency of standard ones. They can now change over 70 percent of their operations to oil, electric, or propane. For some processes, like fire polishing, only gas can be used.

Oil has recently tripled in price; liquified natural gas has gone up even more. Certain glass products, such as lead glass, tableware, and borosilicate glasses, require electric heating for quality reasons. Gas is the preferred fuel when only capital is considered because all you need to burn it is an air source, two valves to a T, and a nozzle. Oil requires more complicated burners and storage. Coal costs are even more, and electric heat requires the most of all. When heat recovery is added, capital cost begins to mount for coal, oil and gas. When air pollution control equipment is required, the capital picture changes significantly in favor of electric.

Pure carbon dioxide is given off from electrically-melted glass. Carbon dioxide profit calculates to $7.50 per ton of glass produced. Future power plants fired with natural gas or oil are definitely out. The government is pushing utilities to use coal. Hydroelectric power is important in some areas, but it supplies only 5 percent of the U.S. total, and there aren't many sites left. Nuclear power supplies 8 percent; this should increase, but it won't reach the 30 percent once projected. Coal looks like the most likely source to produce electricity. It's cheaper to have coal burned in a power plant. Let that plant deal with the air pollution and melt electrically with no air pollution at all. Then, of course, we're at the mercy of a public utility. Industrial consumers have had service interrupted in both winter and summer months recently, and that trend is likely to continue.

Cost to produce a ton of glass by electric heat or oil heat is exactly the same, $21.00 a ton. When you bring in the carbon dioxide profit of $7.50 per ton of glass, the advantage is clearly with electric melting.

Y-2
Y-2

APD-8
(IGD-88)

LOOKING GLASS

Advanced Products Division

To: Director of Product Development, APD

From: Research, Product Development

Re: Energy Estimates

Copies to:

	START-UP COSTS	EFFICIENCY OF OVENS	POLLUTION CONTROL COSTS	EFFECTIVENESS OF POLLUTION CONTROL
Oil	Moderate	Moderate	High	Moderate
Gas	Moderate	Moderate	Low	Moderate
Electricity	Very High	Very High	Very High	Nearly Perfect
Coal	High	Moderate	High	Low

	TOTAL COST OF ENERGY REQUIREMENTS (INCLUDING ACQUISITION, START-UP & OPERATING COSTS) FOR NEXT FIVE YEARS (including melting unit and pollution control)	FEASIBILITY OF USE OF ENERGY IN YEAR 2000
Oil	$22.1 million	Near zero
Gas	$18.9 million	Near zero
Electricity	$38.0 million	Very high
Coal	$20.0 million	High

Y-1
Y-2

APD-85
(IGD-88)

LOOKING GLASS

Advanced Products Division

To: Director of Product Development, APD

From: Research

Re: Pollution Standards

Copies to:

Until we are prepared to use ultimate energy sources (solar, nuclear), the only way we can meet pollution standards is by electric ovens using electrostatic precipators for most of our melting.

Even though the start-up costs are almost double, we spend very little overtime on pollution control plus we get CO_2 as a product.

Projecting to the year 2000, there's no question about it. Electricity is by far the most cost effective.

Y-1
Y-2

APD-87
(IGD-88)

LOOKING GLASS

Industrial Glass Division

To: Vice-President, IGD

From: Administrative Assistant

Re: Decisions, Decisions

Copies to:

Welcome back! I hope your trip to Europe was relaxing and thoroughly enjoyable. As you requested, I have looked through your in-basket and flagged the important items. Here they are:

(1) A speech at tomorrow night's Sales Award Dinner. (IGD-7)

(2) A call from the President regarding tennis, requiring a response. (IGD-15)

(3) A chance to produce furnace linings. (PRES-4A & B)

(4) Recommendation regarding investment opportunities. (PRES-14)

(5) I heard the Auto Glass plant is running seriously short of soda ash. I know nothing more about this.

(6) You might want to review the substantial variances for some items on Cost of Goods Manufactured for both Specialty and Glass Piping. (IGD-71A & B, 72A & B)

LOOKING GLASS

Industrial Glass Division

To: Plant Manager, Auto Glass

From: Director of Product Development, IGD

Re: Machinery Replacement

Copies to:

DIR-MFG, IGD

The Vice-President has asked me to generate a strategy for replacing machinery over the next 10 years. Could you categorize your machinery into major groups (mixing, melting, etc.) and indicate what will have to be replaced and when? I know your plant has been shortchanged in the past, with the company more interested in the exotic hardware in Specialty Glass. This is a good chance to solidify your equipment picture.

The VP is in a hurry for this--could I have an outline by this afternoon?

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