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Desktop Publishing Applications
for Corporate Graphic Standards

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PART I — INTRODUCTION

The purpose of this thesis was to explore the possibilities of desktop publishing as applied to business graphics. Graham Manufacturing is an established company whose existing printed matter I used in a “before and after” approach.

The intended result is improved quality and consistency of a variety of printed material including a specification sheet, newsletter, internal newsletter, manual and employment application. Each piece could be produced economically in-house and each is based on a template and guidelines which would enable others to update or change the information as necessary.

This project was entirely hypothetical. I received information and input on the work from Graham employees but it was never with the intention that any of this work would ever actually be used by them. While they were helpful, it was also obvious that they were not particularly interested in the work I was doing since they are happy with their publications already and do not have any desire to change them.

I chose this particular company because I have been exposed to their publications for years since my father is a former executive. Having done a number of free-lance projects for them over the years, I started with a good basic knowledge of their attitude and approach to graphic design. The other reason I chose their publications as my “raw material” is because it is about as dry and uninteresting as you can find. The challenge would be in expressing this information in a way that is both inviting and functional. As designer, it would be my responsibility to redefine the problem; to find something about this body of work which would make it unique.

The work was, almost exclusively, produced using a Macintosh SE computer, Hewlett Packard LaserJet 4M printer, Aldus Pagemaker and FreeHand programs.

PART II — RESEARCH

Graham Manufacturing designs and manufactures vacuum and heat transfer equipment, most of which is custom built to meet the individual customer's needs. The principal markets for this equipment are the chemical, petrochemical, petroleum, refining and electric power generating industries. Graham has sales representatives located in over 40 major cities in the United States and abroad. In 1992, they employed 636 people and net sales were \$62,732,000 — both numbers considerably lower than 1991 due to the recession and its negative impact on the company.

Graham has the computers, laserprinters and people capable of producing printed material far superior than what they do produce. Yet management fails to see any reason to spend the time or money on such things.

Corporate Identity

Marks and logos, as we know them today, first began with the rise of industrialization and its manufactured and packaged goods. In the 1930's a number of graphic designers became involved in what would later become known as corporate identity design. After World War II, as the United States began a period of prosperity, the first firm dedicated to trademark and brand design was created. Visual identity design reached a high point during the 1950's and 1960's¹ when designers started to go far beyond the logo or trademark. The overall appearance of promotional material became more important to the visual identity than just merely using a particular logo.²

In the busy, crowded world in which we live today, it is necessary for a corporation, large or small, to pull its visual elements together in a powerful way or lose out to the competition. The company that can not be bothered with its image already has one which is apparent and, most likely, it is a negative one. Since about 83% of the information people acquire is done so visually, the company that is inadequate visually is sure to blend into the crowd.³

Processing information has become a primary aspect in business. Both obtaining information on which decisions will be made and communicating information on which customers, employees, shareholders, etc. will make decisions. A corporation's success often depends on management's ability to comprehend and deal with the problems of communication.⁴ Not only is there the physical appearance of a corporation's identity system but also the subliminal, intangible "feel" that suggests such attributes as power, quality, stability, etc.

The more consistent a company is in presenting itself, the more clearly defined is the

image that the public perceives. This is understandable when you consider the constant onslaught of information today and how limited interest may be in a particular company.

There is also a cumulative effect which comes from uniform graphic appearance. An advertisement, newsletter, manual, etc., is carried along by the one that preceded it and helps to support then one that will follow it by reinforcing and complementing each other. Consequent financial savings are another benefit of this approach.⁵

Unfortunately, most of a company's concerns are with more tangible items such as assembly lines, balance sheets and company cars. All too often the importance of a strong corporate identity is overlooked or neglected since the benefits are not easily measured in dollars and cents and physical gain.⁶

What Is Desktop Publishing?

Desktop publishing is the creation of words and graphics on a personal computer, combined into finished pages and printed to a laser printer.⁷ The Macintosh personal computer was introduced in 1984 and with the introduction of the laserprinter, Aldus PageMaker and Postscript in 1985 — desktop publishing was born. Postscript is the page description language that describes a page, including the typography, in terms of mathematical equations that can be interpreted by a printer or other output device.⁸ Quality is determined mainly by the resolution of the output device, the higher the number of dots per inch (DPI), the cleaner the output will appear. The typical laser printer is 300 DPI while a Linotronic is capable of up to 2540 DPI.

Much of the first wave of the desktop publishing revolution has been in the areas of internal corporate publishing and small organization newsletter production. These areas have proven to be fertile testing ground for refining the technology necessary to produce the low-cost, high quality, easily-formatted publications that desktop publishing was intended for. Undoubtedly, they will continue to be a major segment of the desktop publishing industry in the years to come.⁹

Advantages of Desktop Publishing

Saving Time

In desktop publishing, the production process is quicker and easier than in the traditional process of pasting up typeset pages. Traditionally, a great deal of time-intensive hand work was required for even minor corrections or changes. In addition, formats and standards can be established so that less time is spent laying out and designing pages from scratch for each new project.

Increased Control

In traditional publishing, more people are required to produce a publication, i.e.: the designer, typesetter, and paste-up person. With desktop publishing, the same individual can produce a publication virtually single-handedly and has control over the most minor details.

Flexibility

Printed pages can be changed to meet *specific* needs while remaining cost effective. For example: With minor alterations, the manual for one product can become the manual for another.

Documentation / Information Storage

This thesis is the perfect example. Virtually everything was done on this computer, all the stages of the creation of each piece is documented and saved on disk and even includes the date and time they were saved. Not only was that an important part in the actual creation process, it has been an invaluable tool in the writing of this report.

Cost Effectiveness / Improved Quality

If you needed only 10 or 20 or even 100 of a printed item for whatever purpose, a commercial printer would not even be a consideration since it would be outrageously expensive. With desktop publishing, it is possible to produce just a few printed pieces without this expense while still producing a quality product.

Enhanced Problem Solving

A desktop system can be economically used to explore a greater range of alternatives than was ever possible with traditional methods. Design possibilities, type size and fonts changes can be made and the results seen immediately. Ideally, this should also result in better design solutions.

Disadvantages of Desktop Publishing

The biggest disadvantage in using desktop publishing is that the job of creating a publication is taken out of the hands of professionals and put in the hands of amateurs. Many companies have discovered that this encourages more creativity than their image can handle. Since the responsibility of creating printed material is becoming distributed to different departments in an organization, without set formats, the resulting publications may not even look like they are the product of the same organization.

Corporations are responding to this dilemma by establishing design standards so that different kinds of documents and those being produced by different individuals will have a consistent look.

The Grid System

Grids are used in graphic design to indicate the position of text blocks, images, titles, subheads, etc. on a printed page.¹⁰ The principles of the grid system were developed and used in Switzerland after World War II.¹¹ This technique has been the dominant approach to design for at least twenty years because it is so effective in organizing the page and speeds up layout time. Computers are particularly well matched to this system, the most basic unit consisting of a square pixel.¹²

Without the use of a grid, the designer would have to come up with a new plan for each page. This would not only be time-consuming but the pages would be inconsistent.¹³

Effective use of a grid results in maximum legibility through the simple means of orderliness, clarity and simplicity, regardless of the subject matter and complexity of the technology.¹⁴ Thus, the effective use of a simple grid is much better than making a mess using a more complicated one.

A grid that is not flexible enough will result in a very boring design. A grid that offers too many options is about as useful as not using a grid at all. Each new design problem presents its own requirements for an appropriate grid. What the text says, who the reader is, how the piece will be produced are among the items that should help determine the grid. A corporate newsletter will require a conservative grid with moderate column widths, gutters and margins. Another consideration is who will be using the grid. If it is designed to be used by non-designers, it is necessary that it does not require a great deal of decision making to be used properly.¹⁵

Designers should not feel restricted by a grid. It is possible to break the grid design when necessary to add variety and emphasis to the design.¹⁶

PART III — THE WORK INVOLVED

A General Overview

Before I began any design work on this project I spoke to the president of the company about the intended results so that I would have some goals, a direction to go in. I asked him to simply name a few things that he would like this body of work to project — adjectives, whatever he felt was important.

They were:

- 1) Innovative
- 2) Professional
- 3) Fair Prices (I would not consider it a goal but he did)
- 4) Stand Out
- 5) Get An Edge On The Competition
- 6) New and Different

Since this was an entirely hypothetical project, these seemed like easy enough goals. Nothing out of the ordinary for a corporate identity project. Through experience with them in the past and in looking over the majority of their already existing printed material, my only additional thought was that they are very conservative, which contradicted “new and different.” Somehow I needed to find a happy medium between the two.

I began the work by typesetting (in PageMaker) all of the copy for the publications that I was to redesign – the ideal way to become very familiar with the information I was to be working with. I was not concerned with the format, type style, or size of the copy since it would be changed thousands of times before completion. I did, however, struggle to get the spelling and punctuation as close to perfect as possible. These two items are either right or wrong and will not be altered in the design process. The spelling checker in the PageMaker program is an invaluable tool in finding typographical errors.

Typesetting and Typography

Traditionally, the word typography meant the technical process of printing writing through the use of hot metal type to produce printed pages. Today the term typography has expanded to mean the transmission and communication of alphabetical and numerical information through a variety of methods which includes printing, video and computer display.¹⁷

The act of typesetting itself seems to be a purely mechanical function: You type in the words and select your type specifications and the computer and printer will do the rest. However, the quality of a publication depends on the skill of the typesetter not just on the fonts and printer resolution.¹⁸

The principles behind what may seem to be the secret, specialized practice of the professional typographer and typesetter is actually within the domain of every literate person.¹⁹

Several of the most often made mistakes are the use of “typewriter” (" ") quotes instead of proper quotes (“ ”), using two spaces after a period instead of one, and using double hyphens (--) instead of em dashes (—).²⁰ Another important thing to remember is to position quotes correctly in relation to other punctuation. Commas, periods, exclamation points and question marks go inside quotes when part of a quoted statement, colons and semicolons belong outside.²¹ Still another important rule to keep in mind at this stage is consistency. For example: do you leave a space or no space before and after a dash? Either is acceptable...as long as it is done consistently within a publication.

Being able to type and being a good typesetter are not the same. Typesetting has always been a specialized craft and now that job is being taken out of the hands of professional typesetters and put into the hands of anyone with a desktop publishing system. It is the responsibility of this new generation of publishers to acquire these skills.

Starting the Design

I started out by trying to do one piece at a time before going onto the next. However, since I wanted to have a certain amount of continuity and cohesion between each of the pieces, I then began to go back and forth between them. In order to simplify the process for this report they are documented individually.

The first major design decision was to decide on the typefaces that were to be used. My initial thought was to use a serif for the body copy and a bold sans serif (most likely Helvetica) for the headings. I had pretty much planned on using Garamond (what you are looking at right now) for the body copy before anything was actually started. Once the copy was typed into the computer and I started experimenting with the typefaces a little bit, I found myself very drawn to Rockwell Bold for a possible typeface for the headings. Those two would not work together since two different serif typefaces rarely do. Also, the company who this work was (hypothetically) for is extremely conservative, using the very cliché Helvetica/Times combination for virtually everything.

I found myself questioning why I was almost predetermined to use Garamond for the body copy and a bold sans serif for headings. . .and came up with some poor reasons which I'm embarrassed to admit:

- 1) That's what I always do
- 2) I bought it just for this project so I should use it
- 3) Garamond is a beautiful typeface and I especially like the W's and the numerals
- 4) That's what most other designers would do
- 5) I never used Garamond for a project before
- 6) It's a *safe* combination

At that point I changed my thinking. I have always tended to be very conservative when it comes to combining typefaces and this seemed like a good opportunity to not to be. It was also a challenge to find a typeface that would go well with Rockwell but still be realistic enough to use for a company like Graham.

This is Rockwell Extra Bold **THIS IS ROCKWELL EXTRA BOLD**

Typefaces are like abstract pictures; each carries a message of style. Rockwell is a no-nonsense typeface that seems to project strength and power, attributes appropriate for an engineering firm.

Since it is a distinctive square serif typeface, I needed to find a typeface that would compliment it by not being too similar or obvious. The simplest way of combining typefaces from different families is by combining opposites. It was also necessary to choose a typeface for the body copy that was suitable to the content of the text itself.²²

Some of the possibilities were:

Eras crossed my mind very briefly. It is too distinctive to work well with Rockwell. Because of it's unusual characters and high x-height it would have been too difficult to read.

Avant Garde was another thought but it too is difficult to read because of it's high x-height, it is not space efficient, and I did not like it combined with Rockwell.

Helvetica was a good possibility but I shied away from it because it is standard on every laser printer and very overused. It would have been a safe choice which is the biggest reason I was reluctant to use it.

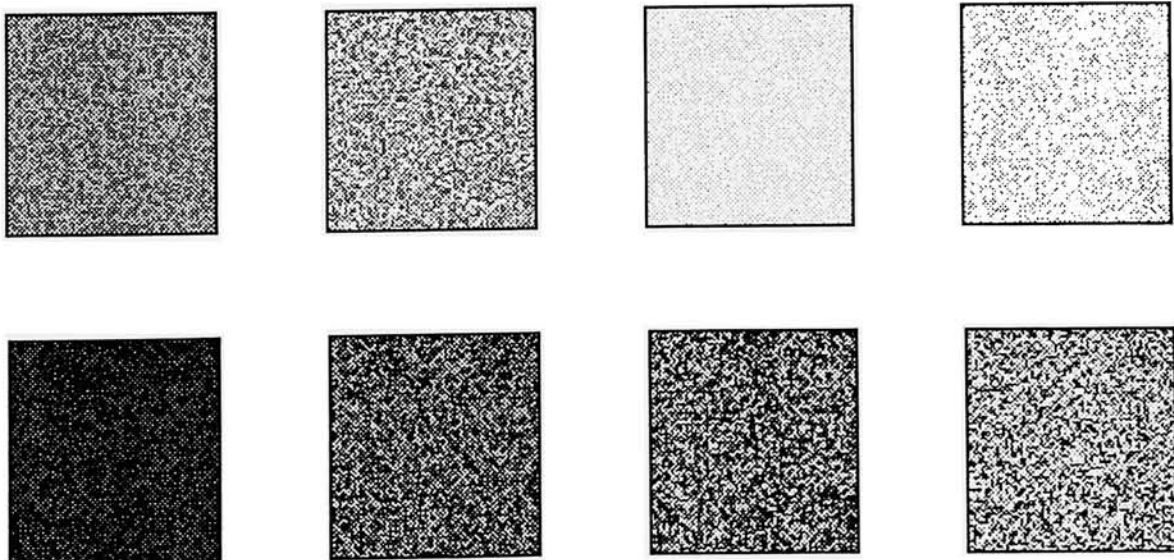
Futura I liked. It is distinctive enough to be slightly different but still legible and conservative enough to work for the pieces I was designing. It had a clear, modern, functional appearance that was appropriate. I was still a little unsure of it at first but there was comfort in knowing I could change it if I decided it wasn't right later on.

The “Granite” Pattern

Ever since I started working on Macintoshes, one of the things that intrigued me the most was the fills and patterns available. While it would be possible to make use of some of these kinds of patterns using traditional paste-up methods, it would be very complicated and difficult from a production standpoint.

Since I was limited to black and white, a resourceful use of gray values would help to create more “color.” It has always been the case in history that new technology offers new opportunities and fresh inspiration for designers.²³ These patterns and fills alone have created a wealth of possibilities that would not have been possible even ten years ago. Creative use of patterns can also be used to create a memorable impression on the reader.²⁴

The background pattern that was to become an on-going theme in this thesis is a custom fill from FreeHand that can be altered in minimum and maximum darkness and lightness from zero to 100. It was created in FreeHand in the size needed, exported as an EPS file, and placed as a graphic in PageMaker. The following is an example of how this one fill could be customized to create the effect desired.




Restrictions

I chose not to alter the Graham logo. I did not feel that it would have been pertinent or beneficial to this thesis to do so. Having to work with it rather than creating one that would have been easier to work into the designs was a challenge in itself.

Another restriction was that I would not change the copy, the content is exactly as it was found in the originals. Graphic designers often have the opportunity to create copy to fit a design. In this thesis project it was necessary to create the designs to fit the copy. It does not matter which comes first, it depends on the nature of the job. In this case the copy was to take preference over the design.²⁵ Had I allowed myself to change things around as was convenient to fit the design, it would have been much easier. There always seemed to be a heading that was just one word too long to fit, a little paragraph here and there that there just wasn't room for, an illustration or photo that was a different shape than the rest, forcing myself to deal with these obstacles rather than just delete them or alter them to my needs made for a much more worthwhile learning experience in the end and was a more realistic approach.

These things were lacking in the original and to top it off it was an eyesore. Why use a laserprinter and then use Courier as the typeface? I wasn't quite sure if it was the typeface, the use of all uppercase or the combination of the two, but I found it very difficult to try and decipher this information.

The first thing I did (after the information was typeset) was try to organize the information into a logical format which ended up being almost identical to the original.

			
Graham Manufacturing Co., Inc. 20 Florence Avenue • Batavia, NY 14020			
HELIFLOW HEAT EXCHANGER SPECIFICATIONS			
Customer:	lkffadla0f	EG:	Sample 1
Customer Ref:	kfdjkld;a	Date:	03-31-1993
Item:	lkfdalkfj	Engineer:	G58
PERFORMANCE			
	INSIDE COIL	OUTSIDE COIL	
DESCRIPTION OF FLUID CIRCULATED	Eth. Gly 50%	Eth. Gly 50%	
Specific Gravity	1.046	1.062	
Specific Heat (BTU/LB F)	0.828	0.795	
Thermal Conductivity (BTU/HR FT F)	0.240	0.241	
Viscosity (Film For Liquids)	1.992	2.833	
Rate of Flow (GPM)	12.0	13.0	
Rate of Flow (PPH)	6277.3	6901.8	
Temperature Entering Heliflow (F)	130.0	65.0	
Temperature Leaving Heliflow (F)	110.0	84.0	
Calculated Pressure Drop (PSI)	5.4	3.0	
Operating Pressure (PSIG)	?	?	
Design Pressure (PSIG)	100.0	50.0	
Hydrastatic Test Pressure (PSIG)	150.0	75.0	
Design Temperature (F)	150.0	150.0	
Connection Sizes (IN)	1 1/4"	1 1/4 "	
Connection Type	MNPT	FNPT	
Total Duty (BTU/HR)		103952.6	
Total Surface Supplied (SQ. FT)		11.6	
Model		12XF - 14S	
Tubes	3/8" Dia - 18 BWG / Copper	Manifolds	70/30 CUNI
Baseplate	Cast Iron	Bolts	Steel
Casing	Cast Iron	Gaskets	Non Asbestos
Tubes to Manifold Joint	Brazed	Code of Construction	Graham Standard
GENERAL:			
Price: F.O.B. Batavia, NY:	Pslfddkajfaldf		
Shipment:	k0ffld;kjf a10kjj;alkjfds akldkfald dajfhldajd kdtja;kljkl		
Weight (LBS)	kdkjaflkfl;10klj		
Remarks:	Drawing Per S-1093 lda;fald0kfl;kjfdalkj;alkfkl afldkif djadlfo;l fajdlfo-l;kdkjdlkjl kklfd ajldrakakoreaulkand f jdkfad;lf d jfaldif jdfjaldkfds kfkklklldfka kkdka xl0fad0kif ajldfkad0l lkjal0jzsrjed		
2.0 - 1002 - 1			

The next thing was to differentiate between the information that would remain the same from one spec sheet to the next and the information that was to change. The information that remains constant is in the screened areas and the information that changes is left white.



Graham Manufacturing Co., Inc. 20 Florence Avenue • Batavia, NY 14020

HELIFLOW HEAT EXCHANGER SPECIFICATIONS

Customer:	Pakfa adlkfajOkflkffadl hgjhhaOf	EG:	Sample 1
Customer Ref:	kdfjkldj;ajhjkij;agif	Date:	03-31-1993
Item:	lkfdalkfij nbhgj	Engineer:	G58

PERFORMANCE

Description of Fluid Circulated		INSIDE COIL	OUTSIDE COIL
		Eth. Gly. 50%	Eth. Gly. 50%
Specific Gravity		1.046	1.062
Specific Heat	[BTU/LB F]	0.828	0.795
Thermal Conductivity	[BTU/HR FT F]	0.240	0.241
Viscosity	[Cp For Liquids]	1.992	2.833
Rate of Flow	[GPM]	12.0	13.0
Rate of Flow	[PPH]	6277.3	6901.8
Temperature Entering Heliflow	[F]	130.0	65.0
Temperature Leaving Heliflow	[F]	110.0	84.0
Calculated Pressure Drop	[PSI]	5.4	3.0
Operating Pressure	[PSIG]	?	?
Design Pressure	[PSIG]	100.0	50.0
Hydrostatic Test Pressure	[PSIG]	150.0	75.0
Design Temperature	[F]	150.0	150.0
Connection Sizes	[IN]	1 1/4"	1 1/4"
Connection Type		MNPT	FNPT

Total Duty	[BTU/HR]	103952.6
Total Surface Supplied	[SQ. FT]	11.6
Model		12XF - 145

Tubes	3/8" Dia-18 BWG/Copper
Code of Construction	Graham Standard

Baseplate	Cast Iron	Casing	Cast Iron
Tubes to Manifold Joint	Brazed	Manifolds	70/30 CUNI
Balls	Steel	Gaskets	Non Asbestos

GENERAL:

Pnce: F.O.B. Batavia, NY:	Psifddkcoifald
Shipment:	kOfld;kjf alOkjf;alkjfds akldkfjald dajfhdojdf kdfja;kfjkl
Weight (LBS)	lfdkjofdkfj;Okfj
Remarks:	Drawing Per S-1093 kjhkjhkjhkjhjhjgkghkjhklklk dkdok koljfd0asd

2.0 - 1002 - 1

The final step was to drop in the background pattern and tie in the logo and address information on the top. It took some experimenting to get the screen to coordinate



Graham Manufacturing Co., Inc. 20 Florence Avenue • Batavia, NY 14020

HELIFLOW HEAT EXCHANGER SPECIFICATIONS

Customer:	Pakffa adlkfaj0kfkfjadl hgjhha0f	EG:	Sample 1
Customer Ref:	kfdjkdl;a-jhkij-gjgf	Date:	03-31-1993
Item:	lkfdalkfij nbhgj	Engineer:	G5B

PERFORMANCE

Description of Fluid Circulated		INSIDE COIL	OUTSIDE COIL
		Eth. Gly. 50%	Eth. Gly. 50%
Specific Gravity		1.046	1.062
Specific Heat	(BTU/LB F)	0.828	0.795
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Temperature Entering Heliflow	(F)	130.0	65.0
Temperature Leaving Heliflow	(F)	110.0	84.0
Calculated Pressure Drop	(PSI)	5.4	3.0
Operating Pressure	(PSIG)	?	?
Design Pressure	(PSIG)	100.0	50.0
Hydrostatic Test Pressure	(PSIG)	150.0	75.0
Design Temperature	(F)	150.0	150.0
Connection Sizes	(IN)	1 1/4"	1 1/4"
Connection Type		MNPT	FNPT

Total Duty	(BTU/HR)	103952.6
Total Surface Supplied	(SQ. FT)	11.6
Model		12XF - 145

Tubes	3/8" Dia-18 BWG/Copper
Code of Construction	Graham Standard

Baseplate	Cast Iron	Casing	Cast Iron
Tubes to Manifold Joint	Brazed	Manifolds	70/30 CUNI
Bolts	Steel	Gaskets	Non Asbestos

GENERAL:

Price: F.O.B. Batavia, NY:	Psfddfkajfaldf
Shipment:	k0fld;kjf al0kif;olkifds akldkfjald dojfdlajdf kdfja;kfjklil
Weight (LBS)	lfdkjafldkfi;10kfi
Remarks:	Drawing Per S-1093 kjhkjhkhkjhkhgkghkjhklklklk dklfad kalfd0asd

2.0 - 1002 - 1

FINAL REDESIGNED SPEC SHEET

Job Application

graham
GRAHAM MANUFACTURING CO., INC.
10 PLUMBERS WAY
LITTLETON, NEW YORK 14868

APPLICATION FOR EMPLOYMENT
(Form No. 2)

THIS COMPANY IS AN EQUAL OPPORTUNITY EMPLOYER AND EMPLOYERS WILL EMPLOY PROMOTELY AND TRANSPARENTLY WITHOUT REGARD TO RACE, CREED, SEX, SEXUAL ORIENTATION, MARITAL STATUS OR DISABILITY

NAME: _____ DATE: _____
TYPE OF WORK DESIRED: _____

NAME: _____ LAST: _____ MIDDLE: _____ SOCIAL SECURITY: _____
CITY: _____ STATE: _____ ZIP CODE: _____

ARE YOU CURRENTLY EMPLOYED? YES NO
 IF YES, NAME OF EMPLOYER: _____ POSITION: _____
 DATE OF DEPARTURE: _____ REASON FOR LEAVING: _____

ARE YOU CURRENTLY UNEMPLOYED? YES NO
 IF YES, DATE OF DEPARTURE: _____ REASON FOR LEAVING: _____

Form of Service	Name and Location	Start Date	City and State	Years of Experience	Grade	Pay	Rate
WORK SCHEDULE OR TOOLS/TOOLS							
PUBLIC WORK							
TRADE							
OTHER							

HAVE YOU EVER BEEN EMPLOYED BY THIS COMPANY? YES NO
 IF YES, SPECIFY NAME WITH WHAT COMPANY AND DATE: _____

OTHER SPECIAL COURSES OR ON-JOB TRAINING: _____

INDUSTRY SERVICE	IF YES	BRANCH OF SERVICE	DATE ENTERED	DATE OF DISCHARGE	REASON FOR DISCHARGE	TYPE
YES	NO					

EMPLOYMENT AND UNEMPLOYMENT HISTORY

ACCOUNT FOR ALL PERIODS OF EMPLOYMENT INCLUDING PERIODS OF UNEMPLOYMENT AND UNEMPLOYMENT AND YOUR PRESENT OR LAST POSITION FIRST THROUGH FIFTH, ETC.

NAME OF COMPANY	STREET	CITY	STATE	ZIP	DATE	POSITION	REASON FOR LEAVING

ARE YOU CURRENTLY EMPLOYED? YES NO
 IF YES, NAME OF EMPLOYER: _____ POSITION: _____
 DATE OF DEPARTURE: _____ REASON FOR LEAVING: _____

ARE YOU CURRENTLY UNEMPLOYED? YES NO
 IF YES, DATE OF DEPARTURE: _____ REASON FOR LEAVING: _____

HAVE YOU EVER BEEN CONTACTED BY A RECRUITER? YES NO
 IF YES, NAME OF RECRUITER: _____

HAVE YOU EVER BEEN CHECKED FOR PRESENT EMPLOYMENT? YES NO
 HAVE YOU EVER BEEN CHECKED FOR YOUR PRESENT EMPLOYMENT? YES NO

I HEREBY CERTIFY THAT THE INFORMATION FURNISHED IN THIS APPLICATION IS TRUE AND CORRECT AND I AM NOT EMPLOYED BY ANY OTHER COMPANY AT THE TIME OF THE SUBMISSION OF THIS APPLICATION AND I AM ACCOUNTABLE TO THE COMPANY FOR THE INFORMATION FURNISHED HEREIN. I HAVE READ AND UNDERSTAND THE TERMS AND CONDITIONS OF EMPLOYMENT OFFERED BY THIS COMPANY AND I AGREE TO ACCEPT THE SAME. I HAVE READ AND UNDERSTAND THE TERMS AND CONDITIONS OF EMPLOYMENT OFFERED BY THIS COMPANY AND I AGREE TO ACCEPT THE SAME.

MONTHLY NET GROSS PAY: _____ DATE: _____

EMPLOYMENT HISTORY

STARTING DATE	JOB TITLE	DATE	EMPLOYER	REASON FOR LEAVING

APPROVED: _____ DATE: _____

To assist us in placing people in their proper position, please complete the following:
 I have had experience in the following positions:

Please check	Title of Position	Months of Experience
_____	Tool & Cutter Grinder	_____
_____	Tool & Die Maker	_____
_____	Machine Shop & Layout	_____
_____	Engine Lathe Operator	_____
_____	Turret Lathe Operator	_____
_____	N.C. Machine Operator Lathe	_____
_____	N.C. Machine Operator Drill	_____
_____	N.C. Machine Operator Mach. Center	_____
_____	Milling Machine Operator	_____
_____	Boring Mill Operator	_____
_____	Planner Mill Operator	_____
_____	Radial Drill Operator	_____
_____	Band/Hack Saw Operator	_____
_____	Blanchard Grinder	_____
_____	Machine Shop Utility Bench Worker	_____
_____	N.C. Programmer	_____
_____	Craftsmen/Blueprint Reading	_____
_____	Department Expeditor	_____
_____	Job Dispatcher	_____
_____	Sandblaster	_____
_____	Painter	_____
_____	Carpenter-Skid/box	_____
_____	Inspector (Physical Dimensions)	_____
_____	X-Ray Technician/Not Inspector	_____

ORIGINAL
JOB APPLICATION

It is obvious that the original job application was an awkward thing to read, fill out or retrieve information from. It also did not present a favorable image of Graham to potential employees. Each piece of paper was done in different type styles and sizes and it had been photocopied so many times that words and rules were blurry or missing. It consisted of two pages front and back and a third sheet that was added that contained the paragraph about the drug screening. That sheet had obviously been added almost as an after thought. At first glance I knew it should all be condensed into two pages front and back, it would just be a matter of making better use of the space available.


Of all the pieces that comprise this thesis, this is the only one that could not be typeset in advance. There are so many tabs, text blocks, rules and screened boxes involved that it was necessary to handle it block by block and then page by page. Before starting to try to redesign the application it was necessary to study the original and decide how to group the information in the most logical way.

These are two of the early “thumbnails” from the initial trial and error stage.

The image displays two early design thumbnails for a job application form. The left thumbnail is a grid-based layout with four main sections: 'IDENTIFICATION / PERSONAL INFORMATION', 'MISCELLANEOUS', 'MILITARY STATUS', and 'EMPLOYMENT & EXPERIENCE'. The right thumbnail is a more detailed form layout with the following sections and fields:

- Date** and **Type of Work Desired** at the top.
- IDENTIFICATION INFORMATION** section containing:
 - Name** (First Last, First, Middle) and **Social Security No.**
 - Street**, **City**, **State**, **Zip Code**, and **Telephone**.
 - Two checkboxes: **Are You a U.S. Citizen?** (YES/NO) and **Are You Age 18 or Older?** (YES/NO).
 - A note: ***If State Law Prohibits Discrimination On The Basis of Age with Respect To Individuals Age 18 or Above.**
 - What Are Your Favorite Hobbies And/Or Interests?** with a large text area below.

Adding the logo, address and title on the front page were the last things added. It took some trial and error to get the background screen and the screens behind the type to coordinate well. Since you cannot see the postscript pattern on the computer screen it was necessary to print it out in order to see each minor value alteration in the pattern.

							
Graham Manufacturing Co., Inc. • 20 Florence Avenue • Batavia, NY 14020							
<h1>APPLICATION FOR EMPLOYMENT</h1> <h2>Form No. 2</h2>							
<i>This company as an equal opportunity employer will employ, promote and transfer employees without regard to race, creed, age, sex, national origin, marital status or disability.</i>							
DATE				TYPE OF WORK DESIRED			
IDENTIFICATION							
NAME (Please Print - Last, First, Middle)						SOCIAL SECURITY NO.	
STREET		CITY		STATE	ZIP CODE	TELEPHONE	
ARE YOU A US CITIZEN?		WHAT ARE YOUR FAVORITE HOBBIES AND/OR RECREATION?					
YES NO							
ARE YOU AGE 18 OR OLDER?							
YES NO							
<small>*NY State Prohibits Discrimination On The Basis Of Age With Respect To individuals age 18 or Above.</small>							
EDUCATION							
TYPE OF SCHOOL	NAME AND LOCATION	MAJOR COURSES	NO. OF YEARS COMPLETED	GRADUATE YES NO	DEGREE	LAST YEAR ATTENDED	
HIGH SCHOOL OR VOCATIONAL							
BUSINESS TRADE COLLEGE OTHER							
HAVE YOU EVER SERVED AN APPRENTICESHIP?		IF YES, SPECIFY TRADE, WITH WHAT COMPANY AND DATES					
YES NO							
OTHER SPECIAL COURSES OR ON-THE-JOB TRAINING				LIST SHOP MACHINES YOU CAN OPERATE			

EXPERIENCE

To assist us in placing people in their proper position, please complete the following if you have had any experience in the positions listed:

✓	Title of Position	Months of Experience	✓	Title of Position	Months of Experience
	Tool & Cutter Grinder			Warehouse Man	
	Tool & Die Maker			Material Handler	
	Machine Shop & Layout			Forklift Operator	
	Engine Lathe Operator			Truck Driver-Class 1 License	
	Turret Lathe Operator			Truck Driver-Class 3 License	
	N.C. Machine Operator Drill			Welder SMAW (Stick/Arc)	
	N.C. Mach. Operator Machine Center			Welder GTAW (Tig/Heliarc)	
	Milling Machine Operator			Welder GMAW (Mig/Innershield)	
	Boring Mill Operator			Welder SAW (Subarc)	
	Planer Mill Operator			Fit-Up/Set-Up Weld Shop	
	Radial Drill Operator			Layout, Plate and/or Sheet Metal	
	Band/Hock Saw Operator			Berner-Machine Gas Plasma	
	Blanchard Grinder			Hand Burner	
	Machine Shop Utility Bench Worker			Shear/Broke/Rolls Operator	
	N.C. Programmer			Cleaner/Grinder Weld Shop	
	Draftsman/Blueprint Reading			Maintenance Electrician/Electronics	
	Department Expeditor			Maintenance Mechanic/Millwright	
	Job Dispatcher			Maintenance Pipefitter/Plumber	
	Sandblaster			Maintenance Carpenter/Cabinet Maker	
	Painter			Maintenance Janitor/Grounds Keeper	
	Carpenter-Skid/Box			Fiberglass Layup	
	Inspector (Physical Dimensions)			Machine Builder/Assembler	
	X-Ray Technician/Not Inspector			Group Leader/Leadman	
	Gasket Cutter			Dept. Foreman/Supervisor	
	Stackroom Keeper				

WORK HISTORY

Please account for all periods of employment, including periods of self-employment and unemployment.
Give your last or present job first, then next position, etc.

NAME OF COMPANY		DATES EMPLOYED	
STREET		CITY	STATE
PAY RATE (PER HOUR)		JOB TITLE	
Start			
End	DUTIES		
REASON FOR LEAVING			
NAME OF COMPANY		DATES EMPLOYED	
STREET		CITY	STATE
PAY RATE (PER HOUR)		JOB TITLE	
Start			
End	DUTIES		
REASON FOR LEAVING			
NAME OF COMPANY		DATES EMPLOYED	
STREET		CITY	STATE
PAY RATE (PER HOUR)		JOB TITLE	
Start			
End	DUTIES		
REASON FOR LEAVING			
NAME OF COMPANY		DATES EMPLOYED	
STREET		CITY	STATE
PAY RATE (PER HOUR)		JOB TITLE	
Start			
End	DUTIES		
REASON FOR LEAVING			
NAME OF COMPANY		DATES EMPLOYED	
STREET		CITY	STATE
PAY RATE (PER HOUR)		JOB TITLE	
Start			
End	DUTIES		
REASON FOR LEAVING			


MISCELLANEOUS							
ARE YOU PRESENTLY EMPLOYED?		HAVE YOU EVER BEEN EMPLOYED BY GRAHAM MFG., INC?		MAY WE REFERENCE CHECK YOUR PRESENT EMPLOYER?		MAY WE REFERENCE CHECK YOUR PAST EMPLOYER?	
Part-Time	YES NO	YES	NO	YES	NO	YES	NO
Full-Time	YES NO						
ARE YOU WILLING TO WORK THE NIGHT SHIFT?		HAVE YOU EVER BEEN CONVICTED OF A FELONY?		IF YES, EXPLAIN BRIEFLY:			
YES	NO	YES	NO				
ANY MILITARY SERVICE?		IF YES - BRANCH OF SERVICE				DATE ENTERED	
YES	NO						
DATE OF DISCHARGE		RANK AT DISCHARGE		TYPE OF DISCHARGE			

NOTICE	
<p>I understand that any false statements in this application shall be cause for summary rejection and/or dismissal from employment.</p> <p>I understand that the entire contents of this application form and/or any accompanying statements and/or attachments may be used by the company should they be required. And I further give Graham Manufacturing Company permission to make inquiry to my former employers.</p> <p>I understand that employment with Graham Manufacturing Company is at will and no contract of employment is created by this employment application, by an offer of employment, or by any other company document, or statement of a manager.</p>	
<p style="text-align: center;">_____</p> <p style="text-align: center;">Signature of applicant (Date)</p>	
<p>Post-Offer/Pre-Employment Drug Screen Testing</p> <p>All job applicants who receive a conditional offer of employment at Graham Manufacturing Company will be required to undergo a drug screen for the presence of illegal drugs or alcohol as a condition of employment. Refusal to consent to such screening will render the applicant ineligible for employment. Applicants who fail the drug test will be denied employment and will be ineligible for future employment for a period of six (6) months.</p> <p>January 1, 1993</p>	

OFFICE USE ONLY				
INTERVIEWED BY		DATE		
COMMENTS				
STARTING DATE	JOB TITLE	RATE	SHIFT	DEPARTMENT
PAYROLL	EMPLOYEE NO.	APPROVED	DATE	

Total Quality Management Update (TQM)

December 17, 1992 Page 1 of 2



TOTAL QUALITY MANAGEMENT

*** UPDATE ***

Graham Manufacturing Co., Inc.

TQM TRAINING

The 24 hour training program discussed during the October TQM Presentation is progressing well. To date 59 people have completed their training. They are:

H. Johns	K. Sheron
J. Ellie	P. Harris
J. Pixley	R. Boyd
B. O'Brien	L. Schmigel
H. Reimer	J. Mikolajczyk
R. Smith	J. Hart
K. Austin	S. Northrup
L. Culling	D. Wase
L. Smith	A. DiPiazza
D. Smith	D. Stokes
T. Smith	P. Marks
L. Wetzel	J. Condane
M. McAllister	E. Marsceill
A. Dennis	J. Bridge
R. Gerould	W. Kubik
H. Kujawski	K. Duerwald
D. Marlin	C. Brucker
D. Birgenheier	R. Hohman
J. D'Alba	J. Lines
A. Miconi	D. Ruck
D. Spring	K. Sullivan
E. Jankowski	C. White
D. Boyce	T. Ronan
L. Sce	E. Clark
J. Aliasso	M. Wolf
G. Parker	T. Cifelli
P. Corbelli	C. Yueckstock
P. Siabert	J. Klein
J. Ellis	C. Zambito
P. Perkins	

We now have a total of 81 people trained in the TQM Process. This is approximately 25 percent of our total employment

Beginning in January, we will start training members of the Carpenter/Sandblast Team and Plate Scrap Reduction Team.

EXTERNAL CUSTOMER COMPLAINT TEAM

A criteria of the Malcolm Baldrige assessment is how external customer complaints are handled. In order to improve Graham's handling of such complaints, we are forming the External Customer Complaint Team which consists of the following members:

D. Tice
C. Stone
J. Jensen
C. Mattice
F. Taradena
C. Przybyz
M. Kohorst
G. Anderson
T. Zilenski

The objective of this team is to develop a system which assures that all external customer complaints are captured and tracked so that analysis and subsequent improvements can be part of the regular cycle.

ORIGINAL TQM NEWSLETTER

J. P. Gorman
J. R. Lines
F. Marks
G. M. Parker
R. E. Richtenberg
M. E. Rumsey
G. C. Schrader
C. A. White

The overall objective of this team is to reduce cycle time. However, to accomplish this, they must first chart existing routes and then set priorities for resolving the various cycle times. They will then layout a plan and determine the need/makeup of sub teams to accomplish their task.

REVISION CYCLE TIME TEAM

This team is our first employee initiated project team.

Revisions and changes to B/M's and drawings are inevitable and can create many problems. The time cycle to handle these appears to be excessive and this team will investigate and determine ways to reduce the processing time required between Drafting and the Purchasing Agent. The team members are:

Duane Clark
Uebbie Fox
Todd McDonald
Keith Sheron
Chris Stone

Page 2 of 2

WORK TEAMS

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Every work team that requires more than one meeting to resolve their problem should prepare minutes of these meetings on Form GQST-2. This is as described on page 9 of your Total Quality Strategy Handbook.

GQST CORNER

If a customer asks whether you can do something for him, the answer is always yes, providing the request is related to your business.

Our job is to take care of the customer so well that he keeps coming back to us for the rest of his life.

If you want to keep their business, give customers exactly what they ask for -- or even more -- without any hesitation. If you do anything less, you might as well offer them nothing, because you will have lost their good will.

SOMETHING TO THINK ABOUT

Successful folks don't just entertain thoughts --- they put them to work.

Happy Holidays to all members of the Graham Team.

Total Quality Management Update is a monthly in-house publication, the target audience being all Graham employees. A copy is sent to managers and a few copies are posted on bulletin boards throughout the company for the majority of the employees.

My thinking behind the new TQM format was that it was not being distributed properly. They wanted all the employees to read it but only gave it to the “important” ones. The rest of the employees, they assumed, were interested enough to go seek this newsletter out on one of several bulletin boards. Not a very realistic expectation, particularly since it is not even remotely appealing visually. The new format I came up with could be put in with the paychecks or put in holders and displayed at the front desk for anyone who would like one.

This new format would make the content seem more important simply by the way it was presented, particularly since this format was unique for this company, and set this newsletter apart from the others.

After deciding on a format, the next step was to arrange the information in more manageable “units” or modules. Their original version was a bunch of short items strung together in a run-on format, giving the pages the impression of time-consuming, continuous reading. By breaking the information down into more manageable blocks of type, the reader can scan more easily. While a modular design is more time-consuming to achieve — having to move items around more in order to achieve the desired effect — the results are more appealing and less intimidating to the reader.²⁷

Before beginning work on the format, but after I had decided the format I would like it to take, I worked on some ideas for the cover or front panel.

UPDATE

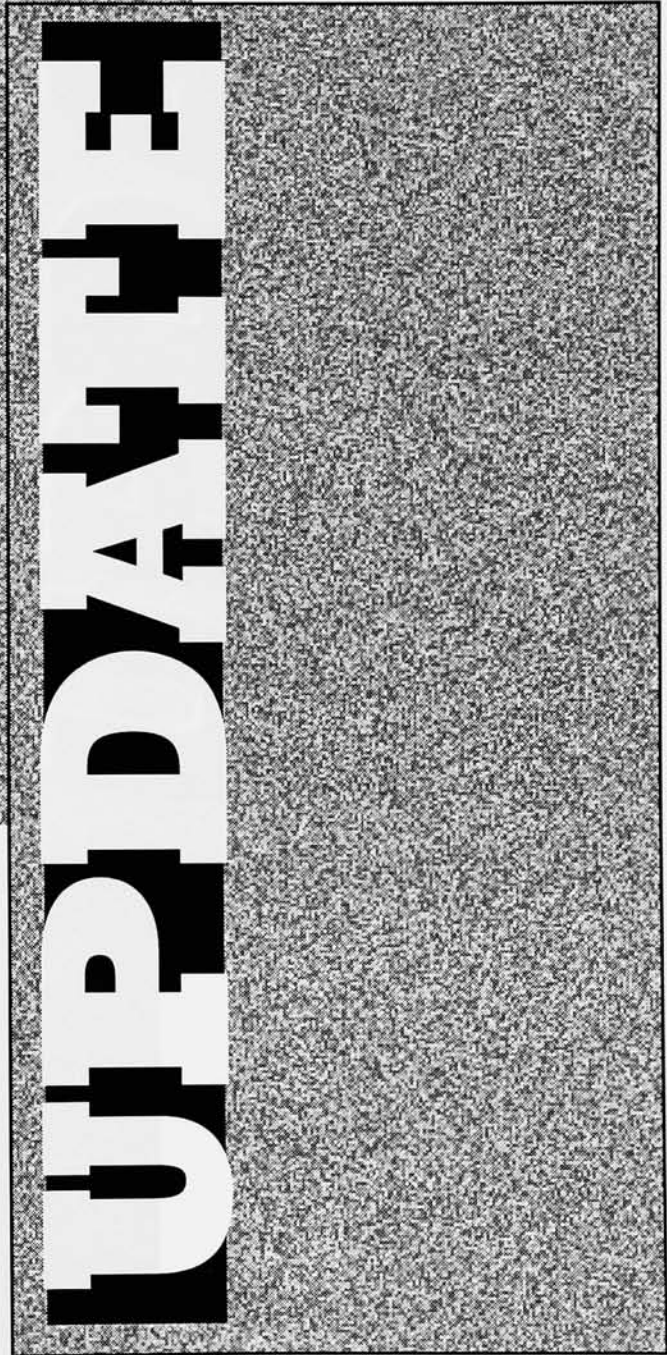
UPDATE

UPDATE

UPDATE

UPDATE

UPDATE



UPDATE

UPDATE

I decided that the embossed version had the most potential and planned on returning to that theme, once the skeleton of the new TQM had taken form. The grid is about as simple as possible — one column per panel or three columns per side. The only problem concerning the grid was to allow space enough between columns for the fold.

At this point I tried out some different ideas as far as how to present the content visually. Did the headings work better reversed? How about a rule underneath the headings to separate them from the body copy? Should the rules top and bottom be darker with reversed type or lighter without reversed type? The following appear in the chronological order in which they were produced:

REVISION CYCLE TIME TEAM
This team is our first employee initiated project team.

Revisions and changes to BOM's and drawings are inevitable and can create many problems. The time cycle to handle these appears to be excessive and this team will investigate and determine ways to reduce the processing time required between Drafting and the Purchasing Agent. The team members are:
Diane Clark Keith Sheron
Debbie Fox Chris Stone
Todd M. Donald

WORK TEAMS
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This is as described on page 9 of your Total Quality Strategy Handbook.

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SOMETHING TO THINK ABOUT
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Total Quality Management

UPDATE

graham

Total Quality Management Update • December 17, 1992

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H. Johns	K. Sheron
J. Ellis	P. Harris
J. Pusley	R. Boyd
B. O'Brien	L. Schinigel
N. Reamer	J. Mikolajczyk
R. Smith	J. Hart
K. Assan	S. Nordrup
L. Culling	D. Hase
L. Smith	A. DiPiazza
D. Smith	D. Strick
T. Smith	P. Marlo
L. Wetzel	J. Condame
M. McMillan	E. Mariscell
A. Dennis	J. Bridge
R. Gerould	W. Kubik
H. Kuprowski	K. Duerwald
D. Martin	C. Brucker
D. Bogenhofer	R. Hohman
J. D. Alba	J. Lines
A. McGoon	D. Ruck
D. Spring	K. Sulbvan
E. Jankowski	C. White
D. Boyce	T. Roman
L. See	E. Clark
J. Akano	M. Wolf
C. Parker	T. Crifelli
P. Corbelli	C. Yuedstock
P. Siebert	J. Klein
J. Ellis	C. Zambro
P. Perkins	

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D. Tice	C. Przybysz
C. Stone	M. Kohorst
J. Jensen	G. Anderson
C. Matice	T. Zienko
F. Taraden	

The objective of this team is to develop a system which assures that all external customer complaints are captured and tracked so that analysis and subsequent improvements can be part of the regular cycle.

ORDER PROCESSING OPTIMIZATION TEAM (OPOT)
Reduced cycle time (time of order through time of shipment) is one area we must improve on to stay competitive. Since we have a variety of products, each must be handled separately. The OPOT has been reorganized and the members are as follows:

G.S. Beckmann	R.E. Richenberg
J.P. Gorman	M.E. Rumsey
F.R. Lines	G.C. Schrader
P. Marks	C.A. White
G.M. Parker	

The overall objective of this team is to reduce cycle time. However, to accomplish this, they must first chart existing routes and then set priorities for resolving the various cycle times. They will then lay out a plan and determine the need/makeup of sub teams to accomplish their task.

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TQM UPDATE • DECEMBER 17, 1992

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J. Ellis	P. Harris	K. Sullivan
J. Puley	R. Boyd	E. Jankowski
B. O'Brien	L. Schwigel	D. Boyce
N. Kramer	J. Mikolajczyk	L. Soa
R. Smith	J. Hart	J. Alvaio
K. Asun	S. Northrup	G. Parker
L. Culling	D. Mose	P. Corbali
L. Smith	A. DiPiazza	P. Stribet
D. Smith	D. Stokes	J. Ellis
T. Smith	P. Marks	P. Parlino
L. Wazzel	J. Condane	C. White
M. McAllister	E. Marsocci	T. Rovan
A. Dennis	J. Bridge	E. Clark
R. Gerould	W. Kubik	M. Wolf
H. Kopynski	K. Duenwald	T. Chalk
D. Martin	C. Bruckner	C. Yurkstad
D. Bingenheiser	R. Holman	J. Klein
J. D'Albo	J. Lines	C. Zamboni
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TOTAL QUALITY MANAGEMENT UPDATE • DECEMBER 17, 1992

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N. Reimer	J. Mikolajczyk	L. See
R. Smith	J. Hart	J. Aliano
K. Auser	S. Northrup	G. Parker
L. Culling	D. Mase	P. Corbelli
L. Smith	A. DiPiazza	P. Siebert
D. Smith	D. Stokas	J. Ellis
T. Smith	P. Marks	P. Perlans
L. Watzel	J. Candone	C. White
M. McAllister	E. Mancini	T. Ronan
A. Dennis	J. Bridge	E. Clark
R. Genouli	W. Kubik	M. Wolf
H. Kuyewski	K. Duerwald	T. Cliff
D. Martin	C. Brudler	C. Voelckrodt
D. Brigenheiser	R. Hoffman	J. Klein
J. D'Alba	J. Lines	C. Zambiro
A. Nicconi	D. Rock	

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TOTAL QUALITY MANAGEMENT UPDATE - OCTOBER 1978

TQM TRAINING

The 24 hour training program discussed during the October TQM presentation is progressing well. To date 59 people have completed their training.

H. Johns	K. Sharon	D. Spring
J. Ellis	P. Harris	K. Sullivan
J. Pasley	R. Boyd	E. Janikowski
B. O'Brien	L. Schmigel	D. Boyce
N. Ravner	J. Mikolajczyk	L. Sca
R. Smith	J. Hart	J. Albasso
K. Ausan	S. Northrup	G. Parker
L. Culling	D. Mose	P. Corbelli
L. Smith	A. DiPiazza	P. Siebert
D. Smith	D. Stokes	J. Ellis
T. Smith	P. Marks	P. Perkins
L. Wierzal	J. Candome	C. White
M. McAllister	E. Manswell	T. Ronan
A. Dennis	J. Bridge	E. Clark
R. Garoud	W. Kubik	M. Wall
H. Kujawa	K. Duenwald	T. Cifelli
D. Marlin	C. Brucker	C. Yundstock
D. Burgenheiser	R. Holman	J. Klein
J. D'Alba	J. Lines	C. Zambito
A. Meconi	D. Ruck	

We now have a total of 81 people trained in the TQM Process. This is approximately 25 percent of our total employment.

Beginning in January, we will start training members of the Carpenter / Sandblast Team and Plate Scrap Reduction Team.

EXTERNAL CUSTOMER COMPLAINT TEAM

A criteria of the Malcolm Baldrige assessment is how external customer complaints are handled. In order to improve Graham's handling of such complaints, we are forming the External Customer Complaint Team which consists of the following members:

D. Tice	C. Przybycz
C. Stone	M. Kahornt
J. Jensen	G. Anderson
C. Matuca	T. Zienala
F. Taroden	

The objective of this team is to develop a system which assures that all external customer complaints are captured and tracked so that analysis and subsequent improvements can be part of the regular cycle.

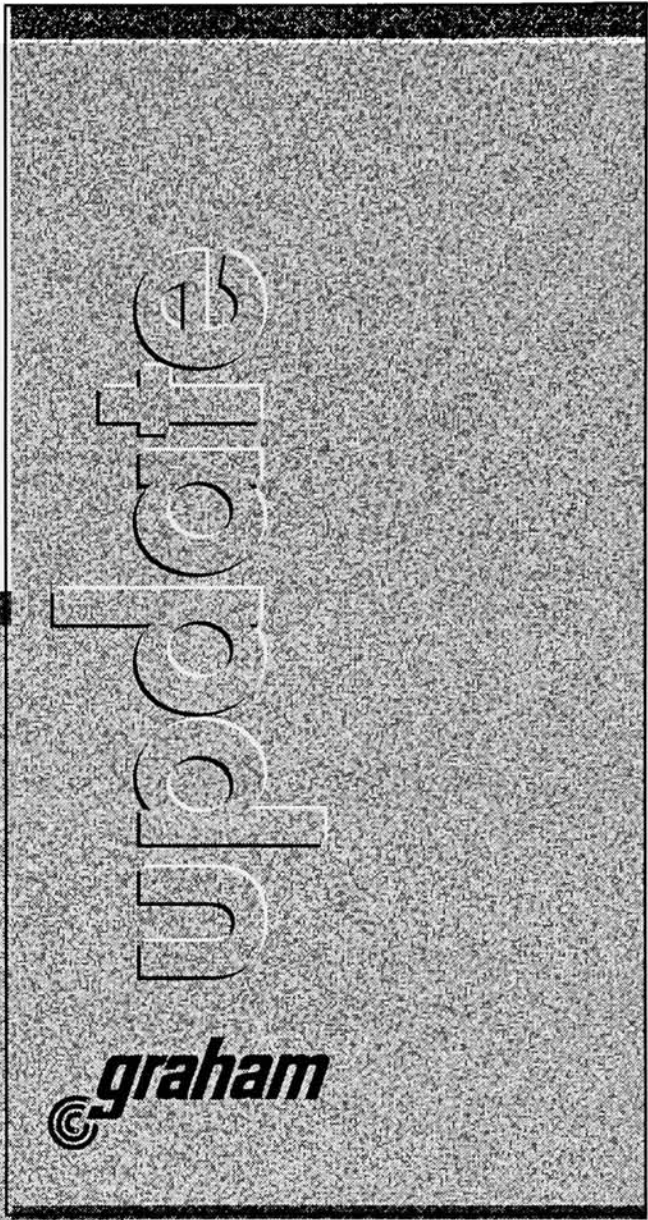
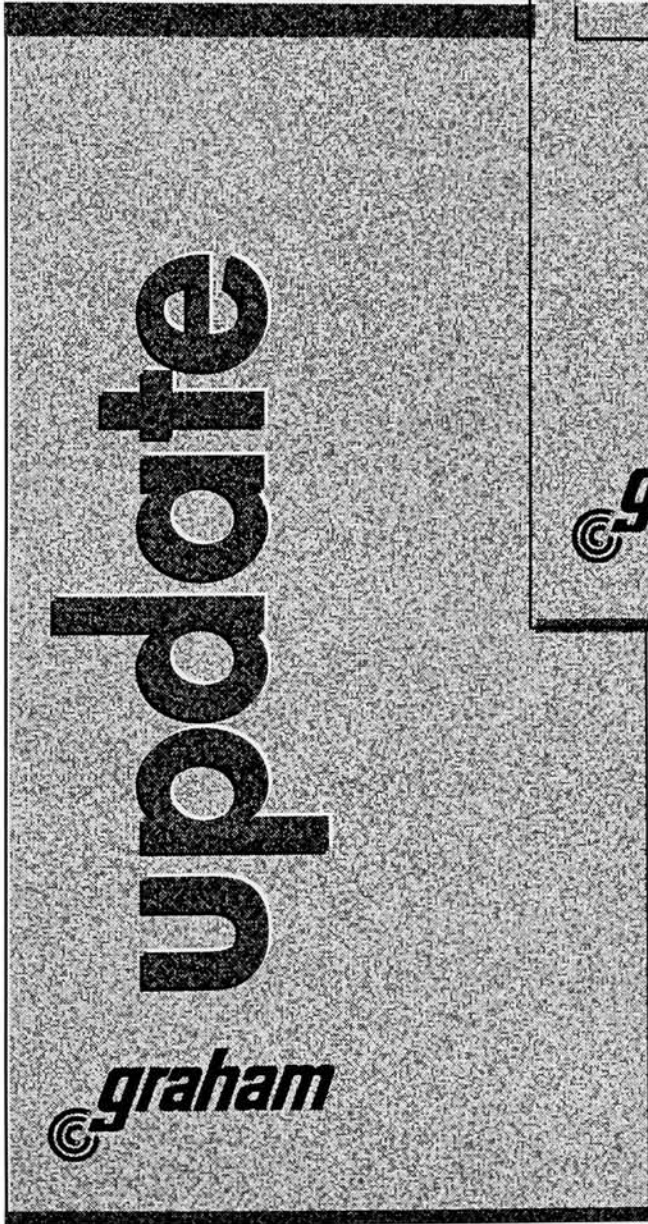
ORDER PROCESSING OPTIMIZATION TEAM (OPOT)

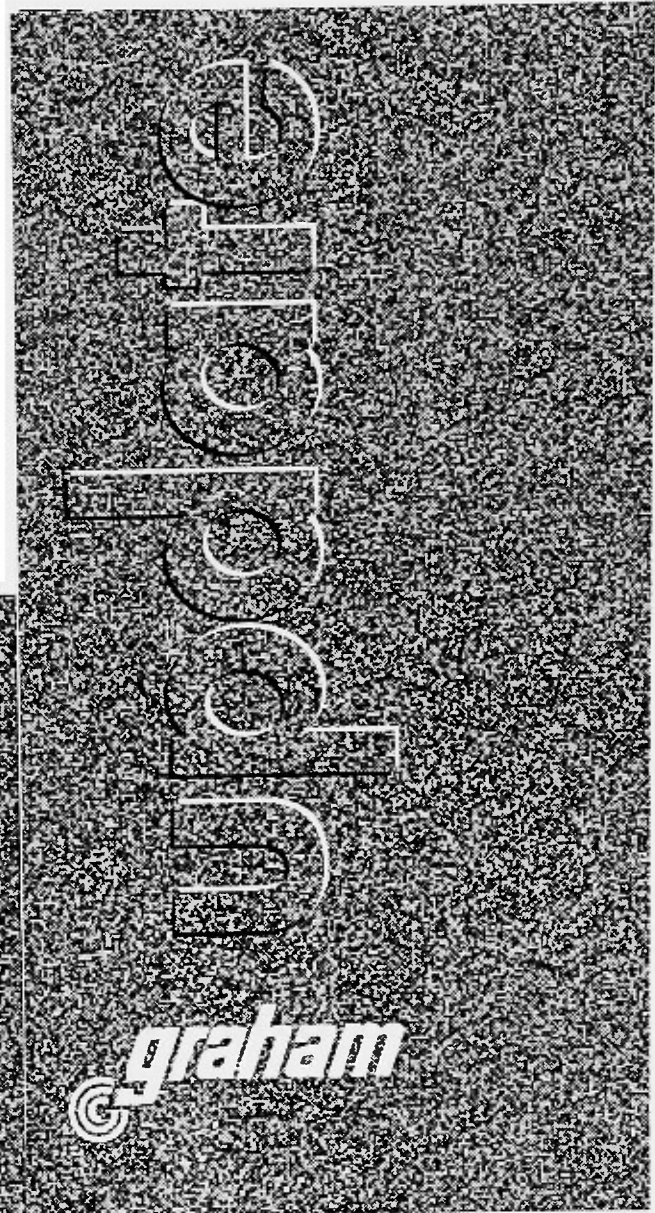
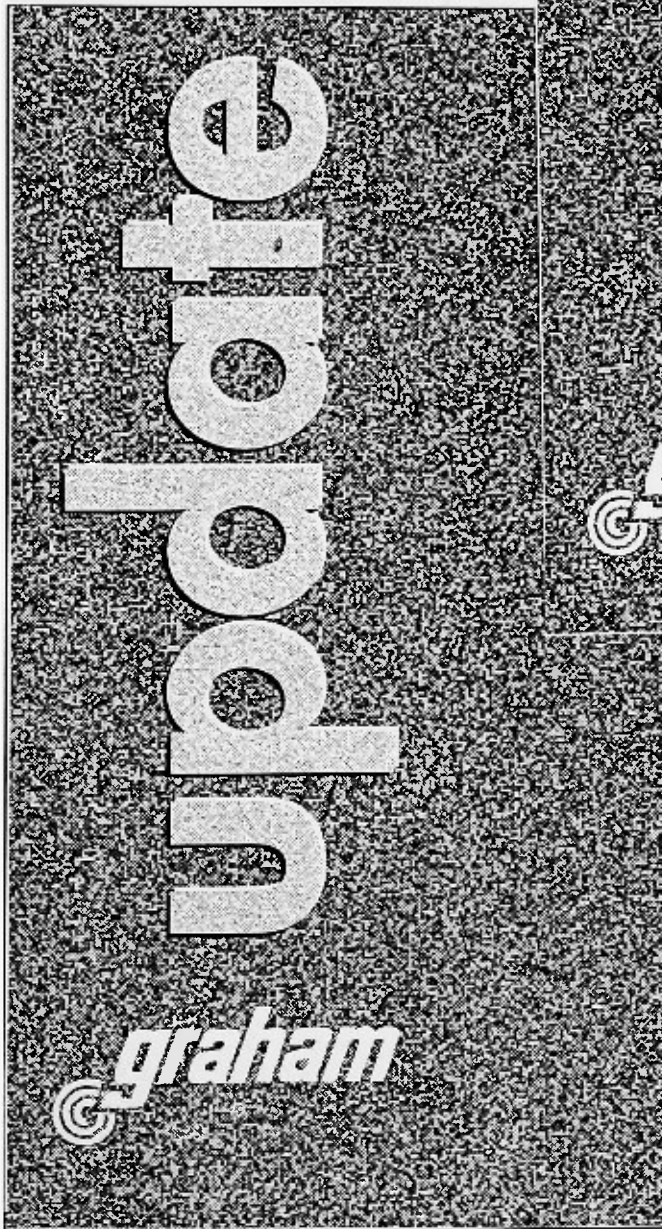
Reduced cycle time (time of order through time of shipment) is one area we must improve on to stay competitive. Since we have a variety of products, each must be handled separately. The OPOT has been reorganized and the members are as follows:

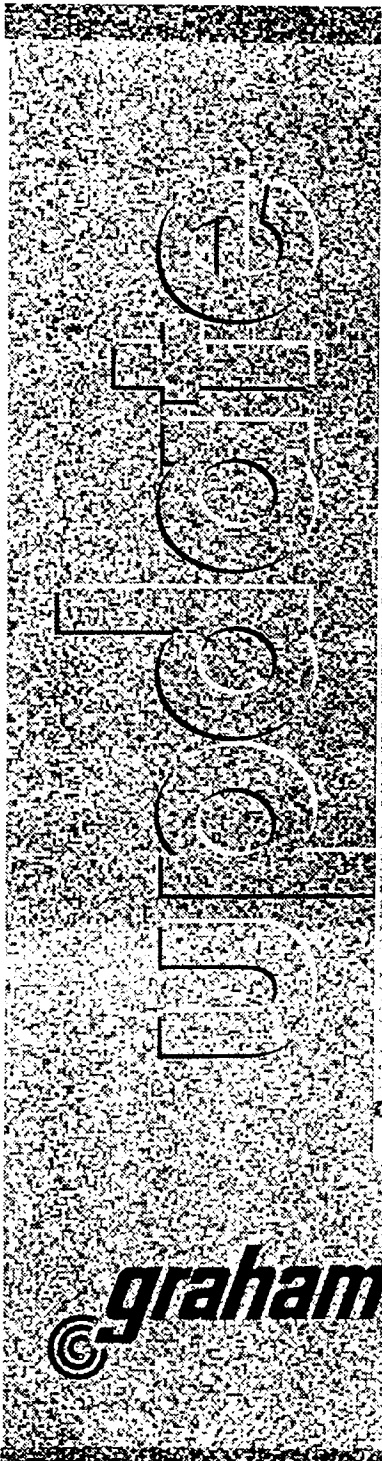
G.S. Bedmann	R.E. Richenberg
J.P. Gorman	M.E. Rumsey
J.R. Lines	G.C. Schroder
P. Marks	C.A. White
G.M. Parker	

The overall objective of this team is to reduce cycle time. However, to accomplish this, they must first chart existing routes and then set priorities for resolving the various cycle times. They will then layout a plan and determine the need / makeup of sub teams to accomplish their task.

I reached the point where I thought that the final one was the strongest while at the same time conforming to the other pieces I was working on. It was time to go back to the cover panel and make sure it would work with the rest of the design.





A vertical logo for 'TOTAL QUALITY MANAGEMENT' is centered on a textured, stippled background. The letters are bold and blocky, with a circular cutout in the center of each letter. The logo is oriented vertically. Horizontal lines are placed between the words: one between 'TOTAL' and 'QUALITY', one between 'QUALITY' and 'MANAGEMENT', and one below 'MANAGEMENT'.

TOTAL
QUALITY
MANAGEMENT

December 17, 1993



December, 1993

update

TOTAL

QUALITY

MANAGEMENT

December 17, 1993

update

TOTAL

QUALITY

MANAGEMENT

 *graham*

 *graham*

December, 1993

update

T O T A L

Q U A L I T Y

M A N A G E M E N T

 *graham*

update

T O T A L

Q U A L I T Y

M A N A G E M E N T

 *graham*

There were many more versions of both the cover and the rest of the newsletter, many with just subtle alterations. Rather than include them all, I chose the ones which better represent the creative process and thought behind them.

Once the cover was decided on, I went back to the tedious job of going over everything with a fine tooth comb. It was at this point where kerning and tracking were done in the headings, the lines were adjusted until they lined up perfectly, and widows and orphans were adjusted. The hyphenation and line breaks were also adjusted for improved readability and to make it more visually appealing.

The bleed gives the page a feeling of expansiveness; unbounded by margins it seems larger than it actually is.²⁸ Since a laser printer cannot print to the very edge of a piece of paper, this effect was achieved by printing it out on legal size paper and then cutting off the excess.

DECEMBER 17, 1992

REVISION CYCLE TIME TEAM

This team is our first employee initiated project team. Revisions and changes to B/M's and drawings are inevitable and can create many problems. The time cycle to handle these appears to be excessive and this team will investigate and determine ways to reduce the processing time required between Drafting and the Purchasing Agent. The team members are:

Duane Clark	Keith Sheron
Debbie Fox	Chris Stone
Todd McDonald	

WORK TEAMS

Many departments have formed work teams to resolve internal problems. We would like everyone to know the results of these teams. Would the leader of each team make sure the TQC is advised of the final results so we can publish them later in this newsletter.

Every work team that requires more than one meeting to resolve their problem should prepare minutes of these meetings on form GQST-2. This is as described on page 9 of your Total Quality Strategy Handbook.

GQST CORNER

If a customer asks whether you can do something for him, the answer is always yes, providing the request is related to your business.

Our job is to take care of the customer so well that he keeps coming back to us for the rest of his life.

If you want to keep their business, give customers exactly what they ask for — or even more — without any hesitation. If you do anything less, you might as well offer them nothing, because you will have lost their good will.

SOMETHING TO THINK ABOUT...
Successful folks don't just entertain thoughts — they put them to work.

HAPPY HOLIDAYS
TO ALL MEMBERS OF
THE GRAHAM TEAM.

strategy

TOTAL
QUALITY
MANAGEMENT

graham

FINAL REDESIGNED TQM UPDATE — FRONT

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- | | | |
|----------------|----------------|---------------|
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| J. Pixley | R. Boyd | E. Jankowski |
| B. O'Brien | L. Schmigel | D. Boyce |
| N. Reimer | J. Mikalajczyk | L. Sce |
| R. Smith | J. Hart | J. Aliasso |
| K. Ausin | S. Northrup | G. Parker |
| L. Culling | D. Mase | P. Corbelli |
| L. Smith | A. DiPiazza | P. Siebert |
| D. Smith | D. Stokes | J. Ellis |
| T. Smith | P. Marks | P. Perkins |
| L. Wetzel | J. Condame | C. White |
| M. McAllister | E. Marsceill | T. Ronan |
| A. Dennis | J. Bridge | E. Clark |
| R. Gerould | W. Kubik | M. Wolf |
| H. Kujowski | K. Duenwald | T. Cifelli |
| D. Martin | C. Brucker | C. Yueckstock |
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| F. Taraden | |

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ORDER PROCESSING OPTIMIZATION TEAM (OPOT)

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|---------------|-----------------|
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The overall objective of this team is to reduce cycle time. However, to accomplish this, they must first chart existing routes and then set priorities for resolving the various cycle times. They will then layout a plan and determine the need / makeup of sub teams to accomplish their task.

Sales World

Graham Sales World is a newsletter which is distributed to some employees and to 100 or so sales agents three times a year. This particular piece was an interesting challenge to me since I had designed the original for Graham several years ago on a free-lance basis. At that time I was not very happy with the final result. Although I did the work there really wasn't an opportunity for creativity since they dictated virtually the entire design. I would work up a series of comps and they would invariably choose the one I liked the least and which was the most boring and conservative. Following issues were produced by the printing company who would simply follow my original, making minor changes here and there as was convenient. After several years of these minor changes it barely resembled the original.

This is also the only piece in which the original used spot color so the other challenge was to try to produce a new version that would work in black and white without the benefit of color.

The major problems with their version were:

- 1) A very boring layout which made poor use of white space
- 2) The quality of the photos was very poor
- 3) It was expensive for them to produce, between \$700-\$1,000 for 400 copies, depending on how many photos were used
- 4) The times / helvetica combination was too bland
- 5) The color really didn't help it all that much
- 6) It lacks unity with Graham's other printed material

The first thing I did was eliminate "Graham" from the title, since I thought the flag would be stronger without it. Virtually every article contains the name at least once and the logotype is also right there on the front page, so having it in the flag seemed redundant.

Since I had typeset the copy already, the first step in designing the new Sales World was to experiment with possibilities for the flag.

GRAHAM SALES WORLD

A Newsletter Published For Representatives
Of Graham Manufacturing Co., Inc.



No. 10 - September 1992

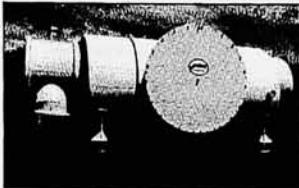
GRAHAM MANUFACTURING CO., INC. 20 Florence Ave. Batavia, New York 14020 Phone (716) 343-2216 Telex (71) 665414Z

SPECIAL DESIGN, SPECIAL SHIPMENT

Graham's most recent condenser supplied for an axial exhaust turbine application went to Delano, California this July. The unit will condense steam exhausted from an

ABB VAX LT-17 turbine at the Delano Biomass Energy Company plant.

In addition to the special support arrangement and steam inlet machining tolerances of all units for VAX turbines, the customer desired to eliminate field welding. A design with hotwell storage capacity integral with the condenser shell was designed. The resulting condenser was nearly 13 feet wide and over 12-1/2 feet tall. The shipping weight of the unit was over 115,000 lbs. These dimensions and weight resulted in a challenging effort to obtain shipping clearance.



Initially, clearance to ship by rail was sought. Due to the over width dimension, the use of a "Special Train" for a portion of the transit was required.

Special trains travel at reduced speed and the per mile charge is much higher than normal. The rail quote for freight exceeded \$60,000. Alternative clearance by special truck was then pursued and obtained. The shipment was made by a 12 axle-three section dolly system truck, resulting in a savings in freight costs for the customer of approximately \$35,000.

This application illustrates Graham's ability to adapt to special requirements in design, manufacturing, and shipping procedures to satisfy customer requirements.

— LARRY CULLING*

FLUE GAS DESULPHURIZATION - LRPV APPLICATION

With the advent of the EPA Clean Air Act and other regulations, the Power Utility Industry is being mandated to reduce SO₂ emissions to the atmosphere. Flue Gas Desulfurization projects will require LRPV's. Fossil fuel plants emit high sulphur levels to the atmosphere causing the acid rain impact on the environment.

Liquid Ring Vacuum Pumps are used in conjunction with large vacuum filters to dewater the filter cake, which is a result of the solid

particulates being removed by the wet limestone scrubber in the exhaust stack. Large stainless steel pumps in the range of 1000-4000 CFM are required for this application. A recent market study indicates that there is a significant opportunity for growth in this area.

The approach to this market is three fold:

1. OEM filter manufacturers
 2. Consulting engineers
 3. Power utility companies direct.
- Adams Brothers is presently

quoting three large size 9 pump packages in 316 SS to Southern Company Services, Inc. for Mississippi Power Company, Daniel Plant (Units 1 & 2). As with all Power Utility market quotes, close support and coordination with all parties concerned will be required.

Please take a close look around your territory for opportunities and advise us in Batavia, and other Graham sales representatives, so we may all optimize our sales efforts.

— DAVE BIRGENIEIER*

ORIGINAL SALES WORLD NEWSLETTER PAGES 1 & 2



In June, DuPont/Chambers Works Plant site conducted an "in-house" table top show specifically for their 3200 plant employees. The theme was "Reducing Leaks and Fugitive Emissions" and consisted of a variety of equipment manufacturers exhibiting and discussing equipment relating to this topic.

Kahl Co. was invited to participate with appropriate equipment and we decided the *Heliflow Vent Condenser* would be a good choice.

Batavia produced a Model 854C-12 VCON Heliflow assembly, complete with a flanged mounting stand which could be placed on the table top for exhibit. We received very favorable responses from the various DuPont employees.

This was a first for DuPont and attendance included various engineers, mechanics, maintenance, and clerical plant personnel. We discovered there was a lot of interest in the Vent Condenser and even those who used Heliflows for years were intrigued by the thought of using it as a Vent Condenser and immediately began discussing several known applications where they could use the equipment. Being able to actually see the unit made it much easier for them to receive it favorably.

We are currently working on several applications and proposals, and expect more in the future because of this show. We appreciated the help we received from Graham in preparing this Condenser.

— KEVIN MAGGS*
KAHL CO.

SALES TRAINEES



Mike Haar

Mike Haar of Sample Bros. St. Louis is one of two of our sales representatives who is spending six months in training at Graham.

The other is Brian Jackson of Process Innovations who began his training at Graham in August.



Brian Jackson

We look at this program as being part of our partnership with our sales force and know it benefits all of us.

A CUSTOMER INSPECTOR'S VIEWPOINT

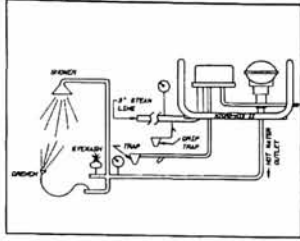
We would like to let you know how some of our customer's inspectors feel about Graham by sharing comments from them.



Our first featured Inspector is Mr. Joseph LaRonda. Joe has been inspecting at Graham for 18 years, representing companies such as Exxon, Aramco, Dow Chemical, and Tecumont. Below is his response when asked a few questions concerning Graham:

1. **What is your overall opinion of Graham?**
Graham provides a quality product worldwide, evidenced by the many projects I have been involved with over the years. Repeat business has allowed Graham to grow and become financially successful.
2. **How is Graham compared to other companies?**
I would say about average. Graham has very good documentation control. Several layers of inspection prior to customer inspection, resulting in a high acceptance level.
3. **Other comments?**
I have always been impressed with Graham's Quality Department's knowledge of the projects I have been involved with, namely, engineering and manufacturing aspects. This is a great help, which makes my job easier.

SAFETY SHOWERS - APPLICATION FOR MICRO MIX II



OSHA regulations require the installation of safety wash stations as close to a hazardous area as possible. Some outdoor installations, along with certain chemicals, require the water to be heated. It is important that water be instantly available and heated to the required temperature. The Micro Mix II is the perfect choice for such applications. The "feed forward" control provides instant unlimited, accurate delivery of heated water. The compact size allows for installation close to the point of use. For systems requiring different station temperatures, 3-way thermostatic mixing valves are utilized. If the facility you call on has steam available, present the benefits of a Micro Mix II water heater for their safety wash system.

—BOB HOHMAN*

FINITE ELEMENT PROGRAM

Graham purchased a *Finite Element Program* in August of 1989. Since that time, we have been able to solve complex problems that, in the past, were impossible to address. *Finite Element Analysis (FEA)*, is primarily used when traditional methods cannot provide sufficiently accurate results. This is done by breaking a particular geometry into much smaller pieces, which make up a finite element model. When forces are applied to the model, the computer program calculates the deflections for each piece of the model. With strain being proportional to the first derivative of the

displacement and stress being proportional to strain, the program is able to determine the stresses for each piece of the model.

Graham has found many uses for *FEA* in the short time this powerful tool has been available. Following are a few examples of how the *Finite Element Method* is being applied:

- design of waterbox covers
- design of frames for vacuum pump and ejector packages
- calculating the maximum forces and moments on nozzles

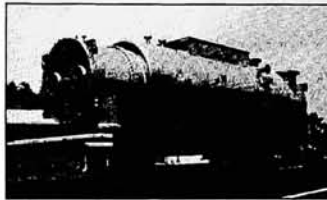
- design of lifting lugs
- design of rectangular steam inlets
- calculation of tubsheet thicknesses
- design of bathtub hotwells
- design of saddle supports

As demonstrated above, the *Finite Element Method* is being used to perform calculations that previously were contracted to outside interests, thus, allowing us to process contracts faster and at a lower cost.

—ALAN SMITH*

GRAHAM CONDENSERS IN JAPAN

Recently we shipped this condenser (one of three) which will be installed in a plant in Japan for Maruzen Petrochemical.



Graham Sales World September 1992 - Page 3

ORIGINAL SALES WORLD NEWSLETTER PAGES 3 & 4

BASED MECHANICAL REFRIGERATION SYSTEMS)

As mentioned in a previous issue, we have witnessed increasing activity in Steam Vacuum Refrigeration (SVR) quotations. Several firm quotes were provided this year to traditional SVR customers (pulp and paper mills expanding their existing chilled water capacity). Fry Equipment, our agent in Colorado, however, has seen an enormous increase in this interest, which is fueled by the Colorado Air Quality Control Commission's proposed regulation, "The Control of Chlorofluorocarbon (CFC) Emissions." This limits the use of mechanical CFC based refrigeration systems due to environmental concerns surrounding their impact on the ozone layer. SVR offers the advantage of requiring no ozone depleting chemicals. In addition, SVR offers the following advantages over mechanical systems:

1. Trouble-free, highly reliable operation with low maintenance requirements.
2. Flexible operation, meeting a wide range of operating requirements with a single unit design.
3. Ability to utilize low pressure steam, with no need for electrical power

Although SVR has traditionally not been cost competitive with CFC based mechanical chillers, it appears to be much more competitive with steam absorption chillers, which also eliminate CFC's. We are currently quoting a surface type SVR unit for a 45 MW combined cycle cogeneration facility which requires chilled water for cooling combustion gas turbine inlet air. The original inquiry specified steam absorption chillers, but after reviewing our budgetary proposal, the customer has requested firm pricing for our SVR system.

Look for SVR applications in your area!!

—CHRIS PRZYBYSZ*

ORDER ENTRY SYSTEM

We recently analyzed the data that we are obtaining in our Order Entry System and would like to thank our sales force for the attention being given in providing us the sales and marketing data on our customers. We are receiving approximately 95% compliance on all purchase orders entered. We urge you to pay close attention to this process, as we believe the information we garner will pay dividends for all of us in the coming years.

We do have some problems in the way the data is being entered, which will be addressed in the near future.

—JOE GORMAN*

SCHEDULE OF EXHIBITIONS

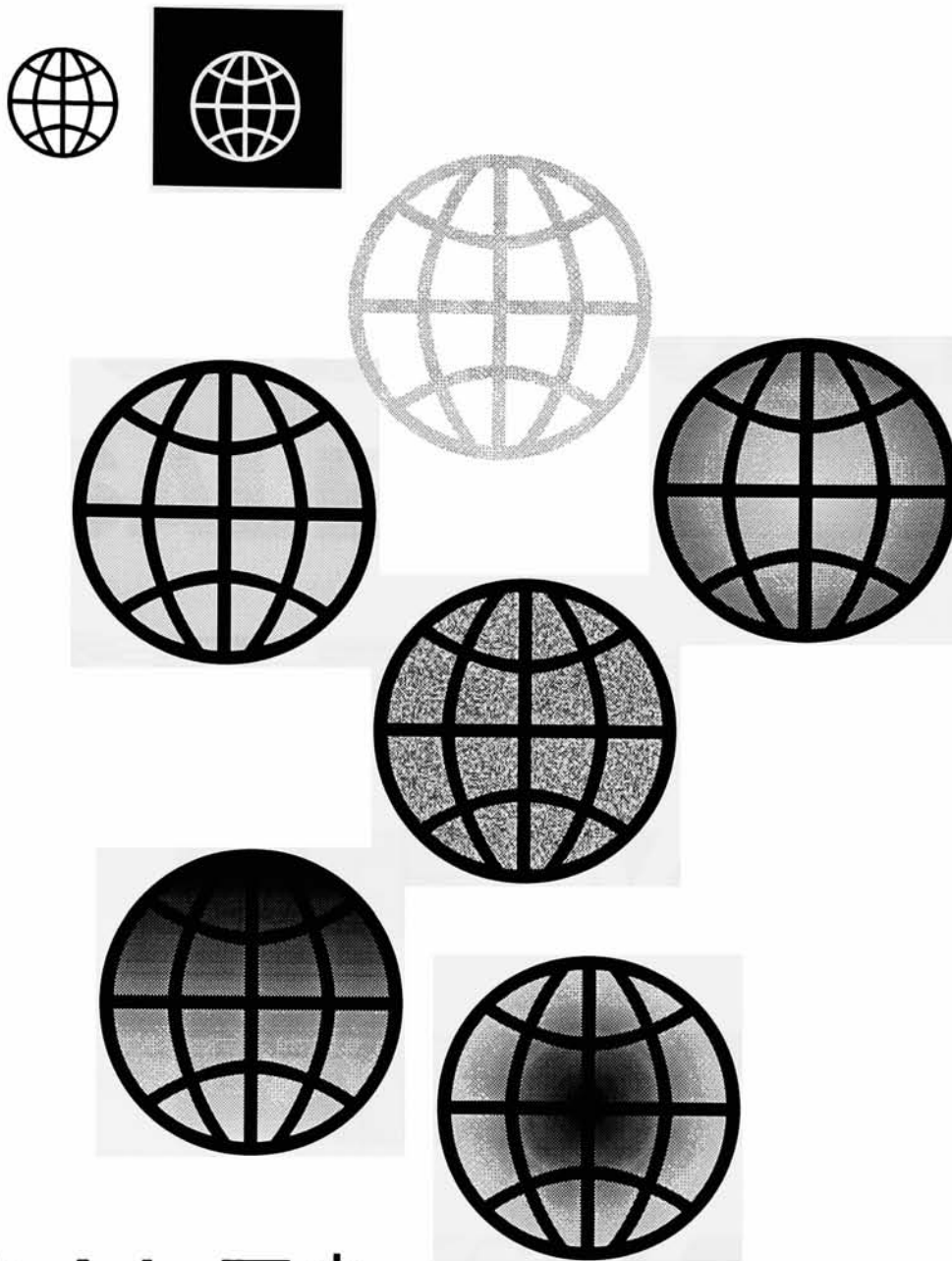
SEPTEMBER - DECEMBER

CHEMICAL PROCESSING TABLE-TOP SHOWS
October 14 - Midland, MI
November 10 - Houston, TX

APE's 1992 ENGINEERED PLUMBING EXPO
November 16-18 - Wash., DC

POWER GEN '92
November 17-19 - Orlando, FL.

This newsletter is strictly for the use of Graham Manufacturing Co., Inc. and their representatives. Any references to customers' data related to installations and process must be considered confidential and of a proprietary nature.



\$ALES\$

The most obvious ideas were the use of dollar signs (for sales) or the globe (for world). That is why I chose to stay away from these. “Sales World” seemed cliché and average and the use of dollar signs or globes would just reinforce that. Although a wonderful graphic treatment cannot compensate for a dumb or mediocre name, it would be better than emphasizing it. I continued in the direction of a more graphic treatment of the flag.

SALES *World*
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SALES **WORLD**

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At the same time I was working on a format and grid for the newsletter. My main goals were to come up with a more exciting layout and to make better use of the white space.

1

Special Design, Special Shipment

Graham's most recent condenser supplied for an acid chloride (acid) application was in Dulles, California this July. This was the condenser stream returned from an ARB VACT-17 reactor at the Dulles Business Energy Company plant.

In addition to the special support arrangements and means with matching tolerances of 41.66 in for VACT surfaces, the customer desired to dismantle field welding. A design with horizontal pump capacity integral with the condenser shell was designed. The resulting condenser was nearly 12 feet wide and over 12 feet tall. The shipping weight of the unit was over 115,000 lbs. These dimensions and weight resulted in a challenging effort to achieve shipping clearance.

big picture

The application illustrates Graham's ability to adapt to special requirements in design, material sourcing, and shipping procedures to satisfy customer requirements. —Larry Collier

Flue Gas Desulfurization - LRV Application

With the advent of the EPA Class A air and other regulations, the Power Utility Industry is being mandated to reduce SO₂ emissions to the atmosphere. Flue Gas Desulfurization projects will

require LRV's. Flue gas plant cost high sulphur levels to the atmosphere causing the acid rain impact on the environment.

Liquid Ring Vacuum Pumps are used in conjunction with large vacuum filters to desolve the flue gas, which as a result of the solid particles to be removed by the wet limestone available to the exhaust stack. Large stainless steel pumps in the range of 1,000-4,000 CFM are required for the application. A recent market study is done that shows a significant opportunity for growth in the area.

- 1. OEM flue manufacturer
- 2. Consulting engineer
- 3. Power utility companies direct

The approach to the market is three fold:
Adams Brothers is presently quoting three large size 9 pump packages as 216 SS in Southern Company Service, Inc. for Mississippi Power Company, Duval Plant (Units 1 & 2). As well as Power Utility market quote, close support and coordination with all parties concerned will be required. Please take a close look around your territory for opportunities and advise us in Dallas, and other Graham sales representatives, so we may all optimize our sales efforts.

— Dave Ruppel

Heliflow Vent Condenser Display

In June, DuPont/Chamber Works Plant are considered as "showcase" site show specifically for their 3,200 plant employees. The theme was "Reducing Levels and Improving Efficiency" and consisted of a variety of equipment manufacturers exhibiting and discussing equipment relating to this topic.

Kali Co. was invited to participate with appropriate equipment and we decided the Heliflow Vent Condenser would be a good choice.

Beva produced a Model 854C-12 VCON

2

High flow assembly, complete with a flanged mounting and which could be placed on the table top for display. We received very favorable responses from the various DuPont employees.

This was a first for Graham and interested individuals from engineers, mechanics, maintenance, and direct plant personnel. We discovered there was a lot of interest in the Vent Condenser and over those who used Heliflow for years were assigned by the thought of using it as a Vent Condenser and maintenance for large diameter general purpose applications where they could use the equipment. Being able to actually see the unit made a much easier for those to receive a benefit.

Photo

We are currently working on several applications and proposals, and expect more in the future because of this show. We appreciate the help we received from Graham in preparing this Condenser.

Sales Trainees

Mike Mast of Simplex Inc. is one of two of our sales representatives who are spending six months in training at Graham.

The other is Brian Jackson of Proton Instruments who began his training at Graham in August. We look to the program as being part of our partnership with our sales force and know a lot of it all.

Two Photos

A Customer Inspector's Viewpoint

It would fair to say you have been some of our customer's inspectors and about Graham by during company from them.

Guy's Photo

Our first framed inspection is Mr. Joseph LaRocca. Joe has been inspecting at Graham for 18 years, after many companies such as Easton, Anstett, Dow Chemical, and Yencos. Below is his response when asked a few questions concerning Graham.

1. What is your overall opinion of Graham? Graham provides a quality product worldwide, readily by the many projects I have been involved with over the years. Repeat business has allowed Graham to grow and become financially successful. I would say overall Graham has very good documentation control. Several layers of inspection prior to customer shipment resulting in a high acceptance level.
2. Other comments?

I have always been impressed with Graham's Quality Department's knowledge of the projects I have been involved with, readily requesting and providing technical support. This is a great help which makes my job easier.

Safety Showers - Application for Micro Mix II

OSHA regulations require the installation of safety showers at sites in a hazardous area as possible. Some accident conditions, along with certain chemicals, require the shower to be located. It is important that water be readily available and heated to the required temperature. The Micro Mix II is the perfect choice for such applications. The "level control" control provides manual, automatic delivery of heated water. The company can allow for modification due to the point of use. For systems requiring different water temperatures, the "level control" control provides manual, automatic delivery of heated water. The company can allow for modification due to the point of use. For systems requiring different water temperatures, the "level control" control provides manual, automatic delivery of heated water. The company can allow for modification due to the point of use.

— Bob Holman

Diagram Finite Element Program

3

Graham purchased a Finite Element Program in August of 1987. Since that time, we have been able to solve complex problems that in the past were impossible to address.

Finite Element Analysis (FEA), a powerful tool when traditional methods can't provide satisfactory results. This is done by breaking a particular geometry into small finite pieces, which make up a finite element model. When forces are applied to this model, the computer program calculates the deformations for each piece of the model. With stress being proportional to the force applied to the displacement and stress being proportional to strain, the program is able to determine the strains for each piece of the model.

Graham has found many new uses for FEA in the design area that previously had been unworkable. Following are a few examples of how the Finite Element Method is being applied.

- design of centrifugal pumps
- design of frames for valves and reactor jackets
- calculating the maximum stress and moment in vessels
- design of lifting legs
- design of centrifugal vanes in valve
- calculation of turbine blades
- design of turbine blades
- design of turbine supports

As discussed above, the Finite Element Method is being used to perform calculations that previously were restricted to manual systems. This, allowing us to process contracts faster and at a lower cost.

— Alan Smith

Graham Condensers in Japan

Recently we shipped the condenser line of duct which will be installed in a plant in Japan for Mitsubishi Petrochemical.

Big Photo Environmentally Safe SVR

Provides Alternative (To conventional CFC Based Mechanical Refrigeration Systems)

As mentioned in a previous issue, we have increased our sales activity in Steam Vapor Refrigeration (SVR) systems. Several large orders were completed this year to traditional SVR customers (pulp and paper mills) expanding their existing critical water systems. For equipment, we agree in Colorado, however, we see an enormous increase in the interest, which is fueled by the Colorado Air Quality Control Commission's proposed regulation, "The Control of Chlorofluorocarbon (CFC) Emissions." The focus on the use of mechanical CFC based refrigeration systems due to environmental concerns is providing their impact on the future SVR. After the advantages of installing a steam operating alternative to address SVR after the following advantages over mechanical systems:

1. Trouble free, highly reliable operation with low maintenance requirements.
2. Flexible operation, meeting a wide range of operating requirements with a single unit design.
3. Ability to utilize low pressure steam, with no need for electrical power.

Although SVR has traditionally been seen as an expensive unit with CFC based mechanical chillers, it appears to be much more competitive with steam absorption chillers, which the dominant CFC. We are currently quoting a surface type SVR unit for a 41 AFW combined cycle cogeneration facility which requires that steam for cooling condenser gas turbine inlet air. The original inquiry specified steam absorption chillers, but after reviewing our budgetary proposal, the customer has requested further pricing for our SVR system.

Look for SVR applications in your area!

—Chris Frybush

Order Entry System

4

We recently analyzed the data that we are obtaining in our Order Entry System and would like to thank our sales force for the attention being given to providing us the sales and marketing data on our customers. We are entering approximately 95% compliance on all purchase orders received. We urge you to pay close attention to this process, as we believe the information we gather will pay dividends for all of us in the coming years.

We do have some problems in the way the data is being received, which will be addressed in the near future.

— Joe Gomez

Schedule of Exhibitions

September - November
Chemical Processing Table-Top Show
October 14 - Midland, MI

November 10 - Houston, TX

ATE - 1992 Equipment Purchasing Expo
November 16-18 - Washington, D.C.

Power Gas '92
November 17 - 19 - Orlando, FL

The readiness to accept the use of Graham Manufacturing Co., Inc. and their representatives. Any reference to customer data related to installations and process must be considered confidential and of a proprietary nature.

GRAHAM CONDENSERS IN JAPAN



Recently we shipped the condenser form of trial which will be installed in a plant in Japan for Mitsubishi Powerplant.

ENVIRONMENTALLY SAFE SVR PROVIDES ALTERNATIVE TO CONVENTIONAL CFC Based Mechanical Refrigeration Systems

As mentioned in a previous issue, we have increased our sales activity in Japan. Various Refrigeration (SVR) quantities. Several line systems were provided for use to industrial SVR customer's body and paper mills supported by their existing (dual) water separator. By Equipment, our agents in Colorado, however, has seen an explosive increase in the use of units as listed by the Colorado Air Quality Control Commission (previously regulated). The General of Chemikorporation (CO) Division. The list of the use of mechanical CFC based refrigeration systems due to environmental concerns surrounding their impact on the ozone layer. SVR offers the advantage of requiring no ozone depleting chemicals. In addition, SVR offers the following advantages over mechanical systems: 1. Trouble free, highly reliable operation with low maintenance requirements. 2. Flexible operation, meeting a wide range of operating requirements with a single unit design. 3. Ability to utilize pressure vessels with no need for electrical power.

Although SVR has traditionally not been associated with CFC based mechanical systems, it appears to be much more compatible with ozone absorption abilities, which also eliminate CFC's. We are currently testing a surface type SVR unit for a 40 MW combined cycle refrigeration facility which requires a dual system for cooling condenser gas turbine inlet air. The original inquiry specified steam absorption chillers, but after reviewing our technology proposal, the customer has requested to try our SVR system.

Look for SVR applications in your area! —Chris Pfeiffer

The Newsletter Published for Representatives of Graham Manufacturing Co., Inc.



In This Issue... Special Shipment... Sales Training... Graham Group To Japan... Order Entry System... Environmentally Safe SVR... Product Abstracts...



SPECIAL DESIGN, SPECIAL SHIPMENT

Customer's most recent order was supplied for an used industrial turbine application were to Delta, California. The unit will condense steam withdrawn from an ABB VAA 11-17 turbine at the Delta Nuclear Energy Company plant.

In addition to the special support arrangements and steam rate matching between all units for VAA turbines, the customer desired to eliminate field welding. A design strategy emerged with the condenser shell was designed. The resulting unit...

The three drawers and weight resulted in a challenging effort to obtain shipping clearance.

Initially, clearance to ship by rail was sought. Due to the low weight dimensions, the use of a "Special Unit" for a portion of the travel was required. Several items were not at standard weight and the unit design is much lighter than normal. The rail quote for freight exceeded \$40,000. Alternative drawings for special freight were then prepared and obtained. The shipment was made by a 12 axle flat car with 100,000 lb capacity. The unit was shipped in a container 6' high x 6' wide for the customer of approximately \$25,000.

This application illustrates Graham's ability to adapt to special requirements in design, manufacturing, and shipping procedures to satisfy customer requirements.

—Larry Cullum

SALES TRAINING

Mike Hase of Santa Ana, CA, was one of our sales representatives who is spending six months in training at Graham.

The other a few members of Process Innovations who began his training at Graham in August. We look at the program as being part of our partnership with our sales force and know it benefits all of us.



HELIFLOW VENT CONDENSER DISPLAY

This was a first for DuPont and other... Heliflow Vent Condenser would be a good choice.

A CUSTOMER INSPECTOR'S VIEWPOINT

We would like to let you know how some of our customer's inspectors feel about Graham for sharing information from them. Our first featured inspector is Mr. Joseph L. Lohmeyer, Sr. who has been inspecting at Graham for 18 years, representing companies such as Lucas, Avco, General Chemical, and Lawrence Livermore National Laboratory when asked a long question concerning Graham.

"We are working on several applications and areas, and expect more in the future because of this show."



FINITE ELEMENT PROGRAM

Customer purchased a Finite Element Program in August of 1995. Since that time, we have been able to solve complex problems that in the past were unresolvable in detail.

Finite Element Analysis (FEA) is primarily used when a relatively realistic correct picture of a structure's behavior is desired. This is done by breaking a structure into a mesh of small elements, which make up a finite element model. When forces are applied to the model, the computer program calculates the deflection for each piece of the model. With stress being proportional to the first derivative of the displacement, the program is able to determine the stresses for each piece of the model.

SAFETY SHOWERS - APPLICATION FOR MICRO MIX II

OSHA regulations require the installation of safety wash stations in those facilities where it is possible that workers could be exposed to hazardous materials. It is important that water be readily available and heated to the required temperature. The Micro Mix II is the perfect choice for such applications. The "hot" feature of control provides water circulation, ensuring that very hot water is not stagnant. The unit allows for modification above the point of use. The system heating different water temperatures. It can be automatically heated or cooled. If the facility you are on has more than one safety shower, the benefits of a Micro Mix II water heater for hot water wash systems.

has been available. Following are a few examples of how the Finite Element Method is being applied:

- design of turbine covers and water passages
calculating the maximum force and moment on turbine
design of flange legs
design of rectangular steam inlet
calculation of exhaust pressure
design of turbine hardware
design of nozzle supports

As demonstrated above, the Finite Element Method is being used to perform calculations that previously were not used to evaluate stresses. This, allowing us to provide accurate heat exchanger design.

—Alan Smith


Although the photos and diagram had already been scanned, they took up an incredible amount of space since PageMaker saves that information within the document. Another option would have been to not save the scans within the document and link them every time you opened the file but even this method was much slower than the one I used. I drew representative drawings in SuperPaint in the same dimensions of the photos. This increased my working time since the paint files are very small and do not slow down the computer which the scans did. It also saved disk space and allowed me to save the multiple working copies as I went along.

After the grid was decided on it took a great deal of trial and error to achieve to desired effect. Page layout is not merely a matter of making the page pretty — it must reinforce the communication of the publication's content. In order to look convincing it must concentrate on the essentials and be designed on clear, functional lines.²⁹

4

ENVIRONMENTALLY SAFE SVR PROVIDES ALTERNATIVE TO CONVENTIONAL (OC BASED) MECHANICAL REFRIGERATION SYSTEMS

GRAHAM CONDENSERS IN JAPAN



Recently we shipped the condenser lines of Japan which will be installed in a plant in Japan for Maruzen Petroleum.

ENVIRONMENTALLY SAFE SVR PROVIDES ALTERNATIVE TO CONVENTIONAL (OC BASED) MECHANICAL REFRIGERATION SYSTEMS

As mentioned in a previous issue, we have introduced a new system in Japan. Several line systems were provided for use in industrial SVR systems (gas and propane), replacing their existing (OC based) systems. The equipment was shipped in containers to the area, which is located in the Chubu Air Quality Control Commission's proposed region. The General of Chubu Air Quality Control Commission - This line is the use of mechanical SVR based refrigeration systems that is environmentally friendly. The equipment is designed to operate at 100% efficiency. The equipment is designed to operate at 100% efficiency. The equipment is designed to operate at 100% efficiency.

1. Ability to utilize low pressure steam, with no need for electrical power.
2. The ability to operate in a wide range of operating temperatures, with a single unit design.
3. Ability to utilize low pressure steam, with no need for electrical power.

Although SVR has traditionally been used in conjunction with OC based mechanical systems, it appears to be more competitive with steam driven systems. This also allows SVR to be used for a wide range of applications. The equipment is designed to operate at 100% efficiency. The equipment is designed to operate at 100% efficiency. The equipment is designed to operate at 100% efficiency.

—Chris Phillips

1

SALES World

The Newsletter Published for Representatives of Graham Manufacturing Co., Inc.

SPECIAL DESIGN, SPECIAL SHIPMENT

Graham's most recent condenser installed for an industrial refrigeration system in Dallas, California. The unit will condense steam extracted from an AM 14817 (7) turbine at the Dallas Electric Energy Company plant.

In addition to the special design and construction and steam extraction requirements, the unit was shipped in a special container. The unit was shipped in a special container. The unit was shipped in a special container.


The condenser is designed to operate at 100% efficiency. The condenser is designed to operate at 100% efficiency. The condenser is designed to operate at 100% efficiency.

SALES TRAINEES

John Taylor
Robert Taylor
Paul Taylor
John Taylor
Paul Taylor
John Taylor
Paul Taylor
John Taylor
Paul Taylor

2

HELIFLOW VENT CONDENSER DISPLAY




In June Graham's Heliflow Vent Condenser Display was installed at the "Helen" site in the Heliflow Vent Condenser Display. The Heliflow Vent Condenser Display was installed at the "Helen" site in the Heliflow Vent Condenser Display.

"We are installing an excellent condenser and propellant, and expect more in the future because of its value."

A CUSTOMER INSPECTOR'S VIEWPOINT

We would like to let you know how some of our customers' inspectors feel about Graham's Heliflow Vent Condenser Display. Our Heliflow Vent Condenser Display has been installed at the "Helen" site in the Heliflow Vent Condenser Display. Our Heliflow Vent Condenser Display has been installed at the "Helen" site in the Heliflow Vent Condenser Display.



3

FINITE ELEMENT PROGRAM

Graham's Finite Element Program is a powerful tool for analyzing the structural behavior of complex structures. The Finite Element Program is a powerful tool for analyzing the structural behavior of complex structures.

"Since that time, we have been able to solve complex problems that, in the past, were impossible to address."

SAFETY SHOWERS - APPLICATION FOR MICRO MIX II

The Micro Mix II safety shower is designed to provide a high volume of water for emergency decontamination. The Micro Mix II safety shower is designed to provide a high volume of water for emergency decontamination.

4

FLUE GAS DESULFURIZATION: LRVV APPLICATION

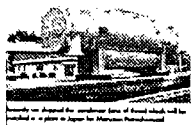
With the advent of the EPA Clean Air Act and other regulations, the Power Utility Industry is being mandated to reduce SO₂ emissions to the atmosphere. Flue Gas Desulfurization (FGD) systems will reduce SO₂ emissions of 80 to 95 percent. Flue gas desulfurization systems will reduce SO₂ emissions of 80 to 95 percent.

Liquid Ring Vacuum Pumps are used to separate wet, sticky materials to slurry for easier handling. This is used for handling particulate matter, such as fly ash, and slurry for the disposal of wet, sticky materials. The application of LRVV pumps are used to separate wet, sticky materials to slurry for easier handling.

The equipment on the market is being sold by
1. CDM like manufacturers
2. Consulting engineers
3. Power utility contractors
4. Process equipment vendors

* A recent market study indicates that there is a significant opportunity for growth in this market.

ORANAH GOES TO JAPAN



Recently we shipped the condenser lines of Oranah which had been installed at a plant in Japan for Nitrogen Dioxide.

FINITE ELEMENT PROGRAM

Condition profiles of Finite Element Program in August of 1987. Since that time, we have been able to solve complex problems for our clients in the past.

Finite Element Analysis (FEA) is a powerful, multi-dimensional analysis tool. It is used to analyze the behavior of structures under various loading conditions. It is used to analyze the behavior of structures under various loading conditions.

With users being represented in the finite element industry, the program is available to all users. It is used to analyze the behavior of structures under various loading conditions.

available. Following are a few examples of how the Finite Element Method is being applied:
1. Design of machine parts
2. Design of structures
3. Design of piping systems
4. Design of electrical systems
5. Design of mechanical systems

An international division, the Finite Element Method is being used to solve problems in a wide variety of fields. It is used to analyze the behavior of structures under various loading conditions.

As an international division, the Finite Element Method is being used to solve problems in a wide variety of fields. It is used to analyze the behavior of structures under various loading conditions.

2

HELIFLOW VENT CONDENSER DISPLAY



This unit works on several different sizes and pressures, and is used to test the latest designs of the plant.

In June DuPont/Chemical Plants are installing the Heliflow Vent Condenser Display in their plants. This unit is used to test the latest designs of the plant.

Rohr Co. has worked in partnership with DuPont/Chemical Plants to develop the Heliflow Vent Condenser Display. This unit is used to test the latest designs of the plant.

Recent production of Model 11 VCCM Heliflow Vent Condenser Display is being used to test the latest designs of the plant. This unit is used to test the latest designs of the plant.

This unit is for use in DuPont and other industrial applications. It is used to test the latest designs of the plant. This unit is used to test the latest designs of the plant.

We are currently working on several applications and projects, and are currently working on several applications and projects. This unit is used to test the latest designs of the plant.

As a result of our partnership with DuPont/Chemical Plants, we are currently working on several applications and projects. This unit is used to test the latest designs of the plant.

A CUSTOMER INSPECTOR'S VIEWPOINT

We would like to let you know how our customers' opinions have been expressed by a survey conducted last year. Our customers' opinions have been expressed by a survey conducted last year.

- Q. What is your overall opinion of Graham?
A. Graham provides a quality product, made by the most people I have known to work with over the years. I have known Graham for 15 years and I am very impressed.
- Q. How do you compare to other companies?
A. I would say Graham compares to other companies. I have known Graham for 15 years and I am very impressed.
- Q. Other comments?
A. I have always been impressed with Graham's Quality Department's knowledge of the product I have been involved with. Quality is important and manufacturing supports this in a great way, which makes my job easier.



ORDER ENTRY SYSTEM

We recently installed the Order Entry System in our Order Entry System and would like to thank you for the assistance being given in providing the sales and marketing data to our customers. We are currently processing approximately 175 applications in all production orders entered. This system is a great asset to the company, and we will continue to improve our system and your service to the best of our ability.

We do have some problems in the way the data is being entered, which will be addressed in the next future.

1

SALES World

The Newsletter
Published for
Representatives of
Graham
Manufacturing
Co., Inc

SPECIAL DESIGN, SPECIAL SHIPMENT

Graham's most recent production supplied for an oil platform before application was to Graham. California the July. The unit will be shipped in a container from an LRVV VAXU-17 further to the Oil Refinery Energy Company plant.

over 100,000 lbs. From this time and weight included in a shipping about in other shipping dimensions.

In addition to the special design and shipment of all units for VAXU-17 further to the Oil Refinery Energy Company plant.

Special design and shipment of all units for VAXU-17 further to the Oil Refinery Energy Company plant.

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Special design and shipment of all units for VAXU-17 further to the Oil Refinery Energy Company plant.

In This Issue...

- Special Design
- Sales Training
- Customer Service
- Product Development
- Quality Control
- Manufacturing Process
- Order Entry System
- Environmentally Safe SVR
- Product Alternatives

SALES TRAINING

More than 100,000 lbs. From this time and weight included in a shipping about in other shipping dimensions.

Special design and shipment of all units for VAXU-17 further to the Oil Refinery Energy Company plant.

Special design and shipment of all units for VAXU-17 further to the Oil Refinery Energy Company plant.

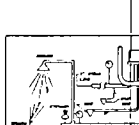
Special design and shipment of all units for VAXU-17 further to the Oil Refinery Energy Company plant.

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3

SAFETY SHOWERS: APPLICATION FOR MICRO MIX II



OSHA regulations require the installation of safety showers in areas where hazardous materials are used. This unit is used to test the latest designs of the plant.

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SALES *World*

SALES *World*

SALES *World*

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SALES *World*

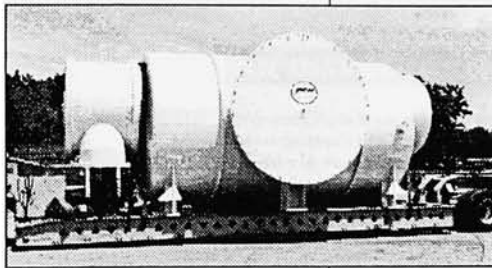
SALES *World*

SALES *World*

SALES *World*

SALES World

The Newsletter
Published for
Representatives of
Graham
Manufacturing
Co., Inc.



SPECIAL DESIGN, SPECIAL SHIPMENT

Graham's most recent condenser supplied for an axial exhaust turbine application went to Delano, California this July. The unit will condense steam exhausted from an ABB VAX LT-17 turbine at the Delano Biomass Energy Company plant.

In addition to the special support arrangement and steam inlet machining tolerances of all units for VAX turbines, the customer desired to eliminate field welding. A design with hotwell storage capacity integral with the condenser shell was designed. The resulting condenser was nearly 13 feet wide and over 12 1/2 feet tall. The shipping weight of the unit was over 115,000

lbs. These dimensions and weight resulted in a challenging effort to obtain shipping clearance.

Initially, clearance to ship by rail was sought. Due to the over width dimensions, the use of a "Special Train" for a portion of the transit was required. Special trains travel at reduced speed and the per mile charge is much higher than normal. The rail quote for freight exceeded \$60,000. Alternative clearance by special truck was then pursued and obtained. The shipment was made by a 12 axle-three section dolly system truck, resulting in a savings in freight costs for the customer of approximately \$35,000.

This application illustrates Graham's ability to adapt to special requirements in design, manufacturing, and shipping procedures to satisfy customer requirements.

— Larry Culling

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Finite Element Program	4
Graham Condensers in Japan	4

FLUE GAS DESULPHURIZATION

With the advent of the EPA Clean Air Act and other regulations, the Power Utility Industry is being mandated to reduce SO₂ emissions to the atmosphere. Flue Gas Desulphurization projects will require LRV's. Fossil fuel plants emit high sulphur levels to the atmosphere causing the acid rain impact on the environment.

Liquid Ring Vacuum Pumps are used in conjunction with large vacuum filters to dewater the filter cake, which is a result of the solid particulates being removed by the wet limestone scrubber in the exhaust stack. Large stainless steel pumps in the range of 1,000-4,000 CFM are required for this application. A recent market study indicates that there is a significant opportunity for growth in this area.

The approach to this market is three fold:

1. OEM filter manufacturers
2. Consulting engineers
3. Power utility companies direct

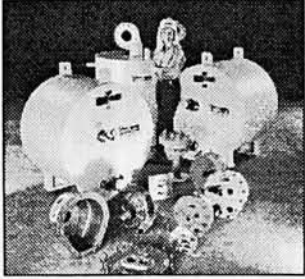
Adams Brothers is presently quoting three large size 9 pump packages in 316 SS to Southern Company Services, Inc. for Mississippi Power Company, Daniel Plant, (Units 1 & 2). As with all Power Utility market quotes, close support and coordination with all parties concerned will be required. Please take a close look around your territory for opportunities and advise us in Batavia, and other Graham sales representatives, so we may all optimize our sales efforts.

— Dave Birgenheier



Graham Manufacturing Co., Inc. • 20 Florence Avenue, Batavia, New York 14020 • Phone (716) 343-2216 • Telex (71) 6854142

HELIFLOW VENT CONDENSER DISPLAY



"We are working on several applications and proposals, and expect more in the future because of this show."

In June, DuPont/Chambers Works Plant site conducted an "in-house" table top show specifically for their 3,200 plant employees. The theme was "Reducing Leaks and Fugitive Emissions" and consisted of a variety of equipment manufacturers exhibiting and discussing equipment relating to this topic.

Kahl Co. was invited to participate with appropriate equipment and we decided the Heliflow Vent Condenser would be a good choice.

Batavia produced a Model 8S4C-12 VCON Heliflow assembly, complete with a flanged mounting stand which could be placed on the table top for exhibit. We received very favorable responses from the various DuPont employees.

This was a first for DuPont and attendance included various engineers, mechanics, maintenance, and clerical plant personnel. We discovered there was a lot of interest in the Vent Condenser and even those who used Heliflows for years were intrigued by the thought of using it as a Vent Condenser and immediately began discussing several known applications where they could use the equipment. Being able to actually see the unit made it much easier for them to receive it favorably.

We are currently working on several applications and proposals, and expect more in the future because of this show. We appreciate the help we received from Graham in preparing this Condenser.

— Kevin Maggs, Kahl Co.

AN INSPECTOR'S VIEWPOINT

We would like to let you know how some of our customer's inspectors feel about Graham by sharing comments from them.

Our first featured inspector is Mr. Joseph LaRotonda. Joe has been inspecting at Graham for 18 years, representing companies such as Exxon, Aramco, Dow Chemical, and Tecnimont. Below is his response when asked a few questions concerning Graham:



Q What is your overall opinion of Graham?

A Graham provides a quality product worldwide, evidenced by the many projects I have been involved with over the years. Repeat business has allowed Graham to grow and become financially successful.

Q How is Graham compared to other companies?

A I would say above average. Graham has very good documentation control. Several layers of inspection prior to customer inspection, resulting in a high acceptance level.

Q Other comments?

A I have always been impressed with Graham's Quality Department's knowledge of the projects I have been involved with, namely, engineering and manufacturing aspects. This is a great help, which makes my job easier.

ORDER ENTRY SYSTEM

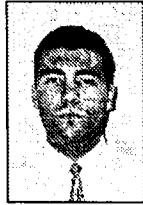
We recently analyzed the data that we are obtaining in our Order Entry System and would like to thank our sales force for the attention being given in providing us the sales and marketing data on our customers. We are receiving approximately 95% compliance on all purchase orders entered. We urge you to pay close attention to this process, as we believe the information we gather will pay dividends for all of us in the coming years.

We do have some problems in the way the data is being entered, which will be addressed in the near future.

— Joe Gorman



Mike Haar



Brian Jackson

SALES TRAINEES

Mike Haar of Sample Bros. St. Louis is one of two of our sales representatives who is spending six months in training at Graham.

The other is Brian Jackson of Process Innovations who began his training at Graham in August.

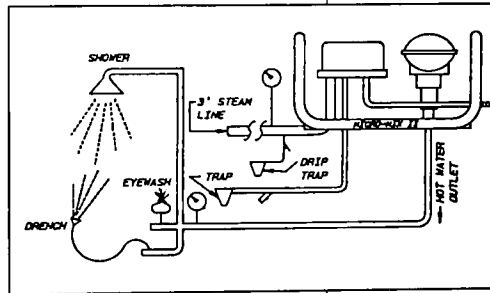
We look at this program as being part of our partnership with our sales force and know it benefits all of us.

SAFETY SHOWERS: APPLICATION FOR MICRO MIX II

OSHA regulations require the installation of safety wash stations as close to a hazardous area as possible. Some outdoor installations, along with certain chemicals, require the water to be heated. It is important that water be instantly available and heated to the required temperature.

The Micro Mix II is the perfect choice for such applications.

The "feed forward" control provides instant unlimited, accurate delivery of heated water. The compact size allows for installation close to the point of use. For systems requiring different station temperatures, 3-way thermostatic mixing valves are utilized.



If the facility you call on has steam available, present the benefits of a Micro Mix II water heater for their safety wash system.

— Bob Hahman

ENVIRONMENTALLY SAFE SVR PROVIDES ALTERNATIVE

(To conventional CFC Based Mechanical Refrigeration Systems)

As mentioned in a previous issue, we have witnessed increasing activity in Steam Vacuum Refrigeration (SVR) quotations. Several firm quotes were provided this year to traditional SVR customers (pulp and paper mills expanding their existing chilled water capacity.) Fry Equipment, our agent in Colorado, however, has seen an enormous increase in this interest, which is fueled by the Colorado Air Quality Control Commission's proposed regulation, "The Control of Chlorofluorocarbon (CFC) Emissions." This limits the use of mechanical CFC based refrigeration systems due to environmental concerns surrounding their impact on the ozone layer. SVR offers the advantage of requiring no ozone depleting chemicals. In addition, SVR offers the following advantages over mechanical systems:

1. **Trouble-free, highly reliable operation** with low maintenance requirements.
2. **Flexible operation**, meeting a wide range of operating requirements with a single unit design.
3. **Ability to utilize low pressure steam**, with no need for electrical power.

Although SVR has traditionally not been cost competitive with CFC based mechanical chillers, it appears to be much more competitive with steam absorption chillers, which also eliminate CFC's. We are currently quoting a surface type SVR unit for a 45 MW combined cycle cogeneration facility which requires chilled water for cooling combustion gas tubing inlet air. The original inquiry specified steam absorption chillers, but after reviewing our budgetary proposal, the customer has requested firm pricing for our SVR system.

Look for SVR applications in your area!

— Chris Przybysz

"Since that time, we have been able to solve complex problems that, in the past, were impossible to address."

EXHIBITIONS

September - December

Chemical Processing Table-Top Show
October 14 - Midland, MI
November 10 - Houston TX

APE's 1992 Engineered Plumbing Expo.
November 16-18 - Washington, D.C.

Power Gen '92
November 17-19 - Orlando, FL

FINITE ELEMENT PROGRAM

Graham purchased a Finite Element Program in August of 1989. Since that time, we have been able to solve complex problems that, in the past, were impossible to address.

Finite Element Analysis (FEA), is primarily used when traditional methods cannot provide sufficiently accurate results. This is done by breaking a particular geometry into much smaller pieces, which make up a finite element model. When forces are applied to the model, the computer program calculates the deflections for each piece of the model. With strain being proportional to the first derivative of the displacement and stress being proportional to strain, the program is able to determine the stresses for each piece of the model.

Graham has found many new uses for FEA in the short time this powerful tool has been

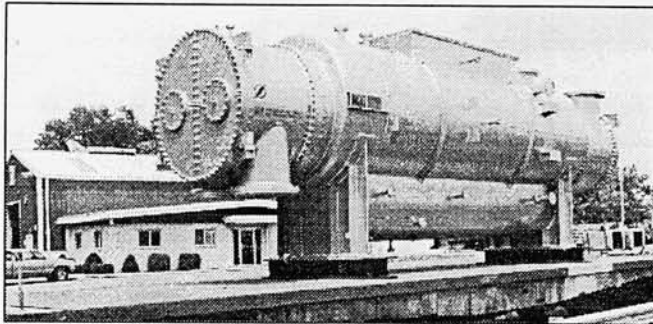
available. Following are a few examples of how the Finite Element Model is being applied:

- design of waterbox covers
- design of frames for vacuum pump and ejector packages
- calculating the maximum forces and moments on nozzles
- design of lifting lugs
- design of rectangular steam inlets
- calculation of tubesheet thickness
- design of bathtub hotwells
- design of saddle supports

As demonstrated above, the Finite Element Method is being used to perform calculations that previously were contracted to outside interests, thus, allowing us to process contracts faster and at a lower cost.

— Alan Smith

GRAHAM CONDENSERS IN JAPAN



Recently we shipped this condenser (one of three) which will be installed in a plant in Japan for Maruzen Petrochemical.

This newsletter is strictly for the use of Graham Manufacturing Co., Inc. and their representatives. Any reference to customers' data related to installations and process must be considered confidential and of a proprietary nature.

Spiral Plate Manual

GRAHAM

VACUUM AND HEAT TRANSFER

SPIRAL PLATE HEAT EXCHANGERS

OPERATION, MAINTENANCE
AND
INSTALLATION MANUAL

GRAHAM MANUFACTURING CO., INC.
20 FLORENCE AVE.
BATAVIA, NEW YORK 14020

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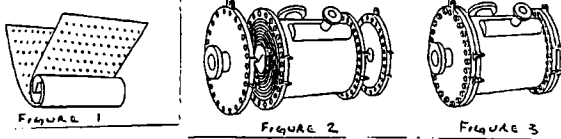
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ORIGINAL PAGES FROM
SPIRAL PLATE MANUAL

SECTION 1 INTRODUCTION

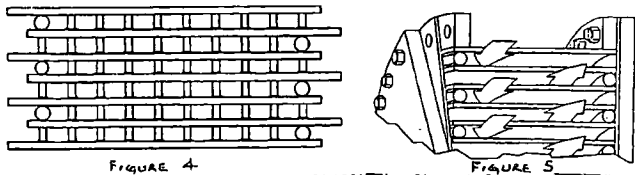
1.0 Introduction

Spiral Plate Heat Exchangers are close to the ideal for heat transfer. Basically, each unit is an assembly of two long strips of plate wrapped to form a pair of concentric spiral passages. Most often, alternate edges are welded closed to form the two spiral passages. Under certain conditions, one passage can be welded closed at both edges while the other passage is open at both edges. Covers with full face gaskets are fitted to each side of the spiral assembly to complete the unit. See Figures 1, 2 and 3.



The single passage for each side eliminates channeling or "dead spots", and minimizes fouling. Hot fluid enters at the center and flows through the spiral passage to exit at the periphery. Cold fluid enters at the periphery and flows through the other spiral passage to leave at the center.

Typical construction employs spacer studs to establish and maintain the proper dimensions for each passage. Welded edge closures utilize a spacer/closing bar as indicated below in Figures 4 and 5.



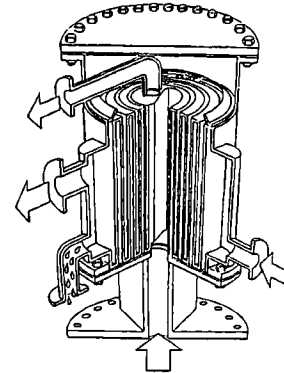
It should be noted that spiral plate heat exchangers are sometimes furnished without spacer studs when special applications so require.

ORIGINAL PAGES FROM
SPIRAL PLATE MANUAL

2.4 SCP Flange Mounted Heat Exchanger (See Figure 9)

A flange mounted spiral plate heat exchanger can be incorporated directly into the structure of process equipment as a bottoms heater or as a condenser.

The service fluid flows inside the closed spiral channel. Process fluid can enter the unit as liquid or vapor from above or below the coil and can be directed into spiral, cross, or combination flow depending on the volumetric flow rate and desired temperature profile. Some SCP spiral plate heat exchangers use one channel welded closed. These can be cleaned only by circulating steam or a cleaning solution through the closed channel.



2.5 Other Configurations

The four designs illustrated here represent the vast majority of applications for this equipment, though other configurations are possible. One should remember that all designs involve the use of the basic spiral element, with various flow arrangements created by headers, distribution chambers, baffling and manifolds. By referring to the drawings furnished against your order, construction features and flow arrangements can be determined.

SECTION 3 INSTALLATION

3.1 Initial Inspection

Inspect for shipping damage to the unit. If protective nozzle covers are damaged, look for internal contamination. If unit is contaminated, follow the cleaning procedure (Paragraph 5.2) and replace protective covers if unit is going to be stored. If unit is damaged structurally, notify the carrier immediately, and then contact Graham Manufacturing Co., Inc.

Verify that the operating pressure and temperature of the process do not exceed the design limits indicated on the unit nameplate.

The Spiral Plate Manual is one of many manuals that Graham produces but they all have a similar format. They are all written in very general terms since every piece of equipment is custom built. This particular piece of equipment will cost the customer between \$5,000 and \$100,000. This manual can be used for a minimum of ten years and between ten and twenty will be sent to customers over the course of a year. Over the course of ten years they will need *at least* 250.

As a product becomes more expensive, so should the way it is promoted. If a person is paying a great deal for a quality product, the same degree of quality is expected in the accompanying printed material.³⁰

And yet Graham felt no need to improve the quality of these manuals. Aside from the poor format, the pages were not photocopies straight, the illustrations are not straight and have hand printed figure numbers written in below them, and there very obvious lines where the shadows from the pasted-in illustrations were photocopied. When I asked one of the people responsible for this manual why it looks like it does, their response was that it serves its purpose and only “grease monkeys” use it anyway.

The other major problems with this manual are:

- 1) The Graham logotype is not on it anywhere
- 2) A couple of words were spelled incorrectly
- 3) It does not evoke a feeling of a quality product
- 4) It looks unprofessional and reflects poorly on Graham
- 5) It uses paper inefficiently
- 6) It is difficult to read and to find information in it
- 7) The table of contents refers the reader to page numbers but there are none and some of the diagrams are missing figure numbers which the reader is referred to
- 8) There is no visual hierarchy except for the occasional use of all caps; all type is the same size
- 9) The format is cumbersome and does not open flat

The first consideration was that I wanted it take a booklet format and therefore the pages would have to be a multiple of four if there were to be no blank pages. Since all of the sections (2.1, 2.2, 2.3...) also had page numbers, it was confusing and redundant to have both. I decided to keep the main sections (1, 2, 3...) and get rid of the subsections, using just page numbers in order to index items.

After some experimenting, a simple three column grid seemed like it would be the most logical choice. Before deciding I placed all of the diagrams in both one and two column sizes and printed them to make sure they would reproduce well in this format.

4	<p>Introduction</p> <p>Spiral Plate Heat Exchangers are close to the ideal for heat transfer. Basically, each unit is an assembly of two long strips of plate wrapped to form a pair of concentric spiral passages. Most often, alternate edges are welded closed to form the two spiral passages. Under certain conditions, one passage can be welded closed at both edges while the other passage is open at both edges. Covers with full face gaskets are fitted to each side of the spiral assembly to complete the unit. See Figures 1, 2 and 3.</p> <p>FIGURES 1, 2 and 3</p> <p>The single passage for each side eliminates channelling or "dead spots," and minimizes fouling. Hot fluid enters at the center and flows through the spiral passage to exit at the periphery. Cold fluid enters at the periphery and flows through the other spiral passage to leave at the center.</p> <p>Typical construction employs spacer studs to establish and maintain the proper dimensions for each passage. Welded edge closures utilize a spacer closing bar as indicated below in Figures 4 and 5.</p> <p>It should be noted that spiral plate heat exchangers are sometimes furnished without spacer studs when special applications so require.</p> <p>SSH Counter Current Flow Type (See Figure 6)</p> <p>This channel configuration is used for liquid-to-liquid services and to steam heat liquids. Different spacings can be used for each fluid to facilitate widely varying flow rates or high concentrations of large solids which would plug conventional</p>	5	<p>shell and tube exchangers. When the unit is mounted horizontally, undissolved solids are effectively held in suspension for processing slurries and lumpy liquid streams. The unit is mounted vertically to be used as a condenser or steam heater. For easy maintenance, the hot and cold channels can be entirely exposed by removing their respective covers.</p> <p>FIGURE 8</p> <p>A special design for handling fluids that are toxic or difficult to gasket has one passage welded shut on both sides with the other passage open at each side and sealed by two covers. The closed passage is not accessible for mechanical cleaning while the open passage can be reached from both ends for inspection or mechanical cleaning.</p> <p>SCV Cross Flow/Spiral Flow (See Figure 7)</p> <p>This configuration directs one fluid to spiral from the periphery inward through the spiral body crossways from a flow distribution chamber before the coil to a similar chamber after the coil. Cross flow spirals are used for processing very viscous liquids and high-volume fluids such as vacuum steam or stack gases.</p> <p>Since one channel is welded closed at both ends, that channel is not accessible for visual inspection nor mechanical cleaning. Removal of both covers permits access only to the cross flow channel from both ends. This closed channel design is unsuitable for large pieces of debris washed into the closed channel and care must be taken to prevent plastic bags, welder's gloves, etc. from washing in and catching on the spacer studs. Also avoid using untreated metal as the coolant because of the likelihood of grasses,</p>
6	<p>branches, and other debris entering the coil.</p> <p>FIGURE 7</p> <p>SCV Combination Cross and Spiral Flow (See Figure 8)</p> <p>Combination flow spirals desuperheat, condense, subcool the condensate and cool the noncondensables. The coolant flows through a spiral channel from the outside into the center core. The vapor enters above the coil where the vapor inlet baffle distributes the vapor into the open spiral channels. This baffle causes a number of the outer spiral wraps to provide for subcooling of the remaining vapor after its volume has been reduced by condensing. Subcooling is done in full counter current flow with condensate flowing in the bottom of the channel to a condensate outlet nozzle. Noncondensables spiral out through the last few wraps to a vent connection near the top of the coil.</p> <p>FIGURE 8</p> <p>Removal of the top cover permits access to the hot fluid passage. Removal of the bottom cover provides access to the coolant channel.</p> <p>SCF Flange Mounted Heat Exchanger (SEE FIGURE 9)</p> <p>A flange mounted spiral plate heat exchanger can be incorporated directly into the structure of process equipment as a bottoms heater or as a condenser.</p> <p>FIGURE 9</p> <p>The service fluid flows inside the closed spiral channel. Process fluid can enter the unit as liquid or vapor from above or below the coil and can be directed into spiral, cross, or combination flow depending on the volumetric flow rate and</p>	7	<p>desired temperature profile. Some SCF spiral plate heat exchangers use one channel welded closed. These can be cleaned only by circulating steam of a cleaning solution through the closed channel.</p> <p>Other Configurations</p> <p>The four designs illustrated here represent the vast majority of applications for this equipment, though other configurations are possible. One should remember that all designs involve the use of the basic spiral element, with various flow arrangements created by headers, distribution chambers, baffling and manifolds. By referring to the drawings furnished against your order, construction features and flow arrangements can be determined.</p> <p>SECTION 3 - INSTALLATION</p> <p>Initial Inspection</p> <p>Inspect for shipping damage to the unit, b protective nozzle covers are damaged, look for internal contamination; if unit is contaminated, follow the cleaning procedure (Paragraph 5.2) and replace protective covers if unit is going to be stored. If unit is damaged structurally, notify the carrier immediately, and then contact Graham Manufacturing Co., Inc.</p> <p>Verify that the operating pressure and temperature of the process do not exceed the design limits indicated on the unit nameplate.</p> <p>Construction Standards</p> <p>All Graham spiral plate heat exchangers are inspected and pressure tested at the factory prior to shipment. Units can be constructed in accordance with Graham standards or they can be</p>

Since the copy dictated the order in which the diagrams needed to appear, there was not much leeway as far as arranging the layout of the pages.

Since the copy constantly referred to figure numbers, a logical solution in order to make them easier to locate was to make the figure numbers reverse, kind of like flags. I tried the same with the "See figure 00" notes at the end of sentences or paragraphs.

INTRODUCTION

Spiral Plate Heat Exchangers are close to the ideal for heat transfer. Basically, each unit is an assembly of two long strips of plat wrapped to form a pair of concentric spiral passages. Most often, alternate edges are welded closes to form the two spiral passages. Under certain conditions, one passage can be welded closed at both edges while the other passage is open at both edges. Covers with full face gaskets are fitted to each side of the spiral assembly to complete the unit.

SEE FIGURES 1, 2 AND 3.

1

2

3

The single passage for each side eliminates channeling or "dead spots," and minimizes fouling. Hot fluid enters at the center and flows

3

through the spiral passage to exit at the periphery. Cold fluid enters at the periphery and flows through the other spiral passage to leave at the center.

Typical construction employs spacer studs to establish and maintain the proper dimensions for each passage. Welded edge closures utilize a spacer/dosing bar. **SEE FIGURES 4 AND 5.**

4

5

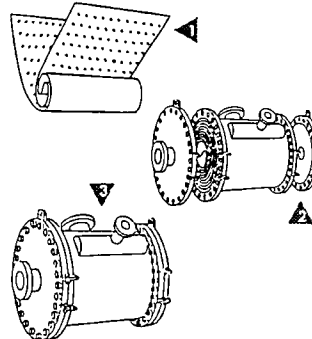
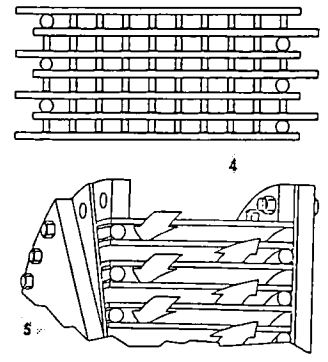
It should be noted that spiral plate head exchangers are sometimes furnished without spacer studs when special applications so require.

4

I liked the thought behind it but the reverse was distracting. I also did not want them competing with the reverse "Caution Boxes" which appear later in the manual. It was also obvious that this treatment of the chapter headings was not going to work, either. The combination of the rule at the top and then the reversed box was too busy and did not work aesthetically.

I did like the idea of moving the figure numbers around. Since the diagrams are a variety of shapes, it was difficult to consistently arrange the figure numbers in the same position relative to the diagrams (i.e.: lower right hand corners). Changing their position was more convenient from a layout standpoint because I could make use of the dead space around each individual diagram. I also preferred it because it produced a more dynamic effect.

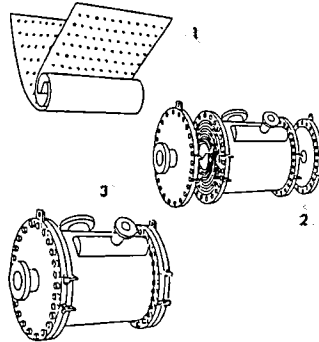
The squares, however, did not effectively direct the reader to the correct figure so I then changed the squares to triangles which act as arrows and started experimenting with different screen values that were not as overwhelming as the reversed ones. The other problem to be addressed at this point was how to handle the chapter headings. The folios were also reduced in size since they were too large.

INTRODUCTION	
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3	4

INTRODUCTION

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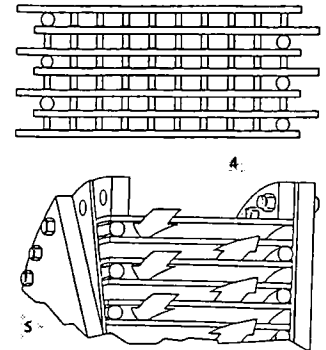
SEE FIGURES 1, 2 AND 3.



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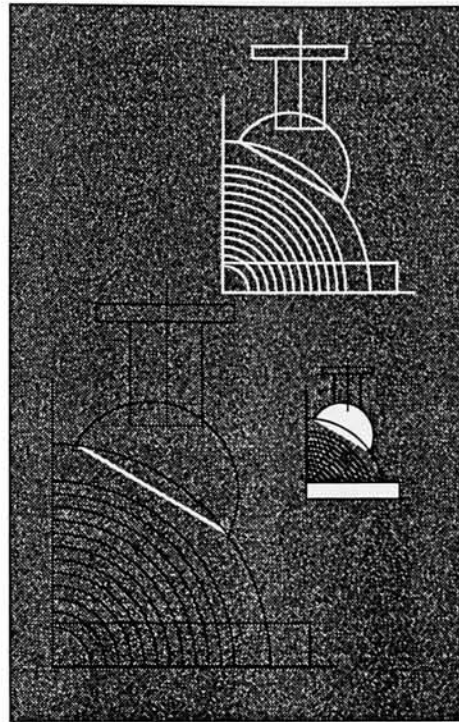
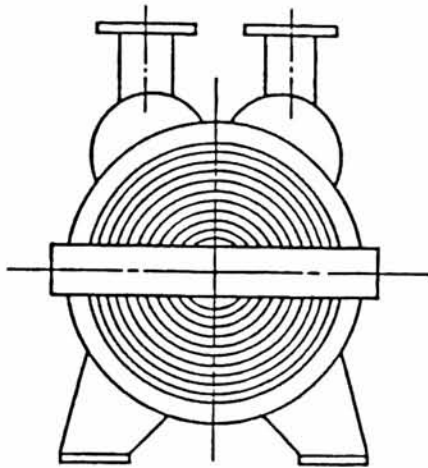


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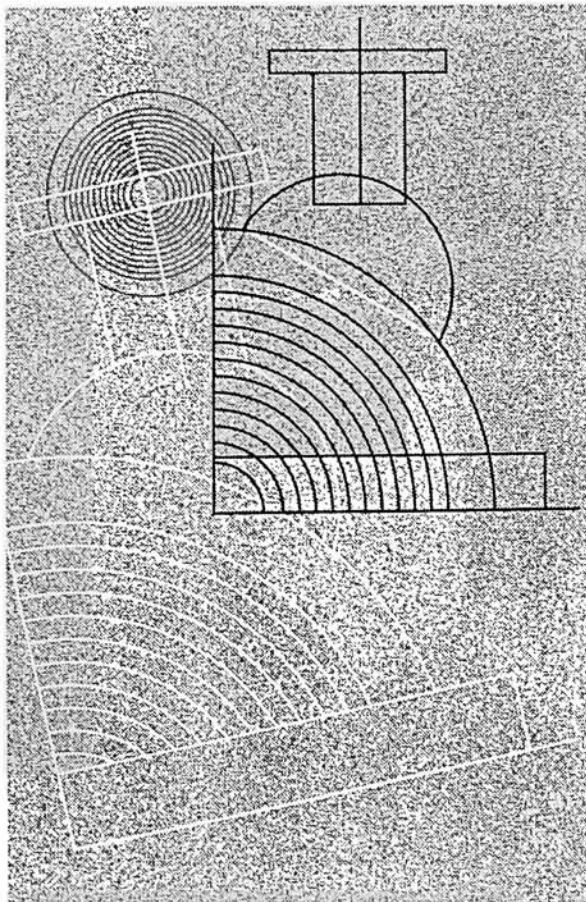
PAGES 3 & 4 FROM THE FINAL REDESIGNED MANUAL

Once the format was decided on, it was a tedious process of going through all of the pages and methodically changing them to conform to that format. The most minor change such as inserting a word or even letter will change the line length and sometimes result in an additional line of text and vice versa, affecting all of the following pages. Thus, it was necessary to start from the beginning of the manual and work page by page to the end. It was necessary to go through this process a number of times before reaching the final version.

The cover of the manual was in process at the same time as the rest of it was. I scoured the diagrams in the manual looking for one with some kind of aesthetic appeal. Since none of them fit that description, I began looking at just portions of them for the same purpose. The abstract graphic which appears on the cover developed from the last diagram in the manual. I imported it into FreeHand and used it as a template to redraw the one section which I thought would make an interesting yet simple graphic for the cover.

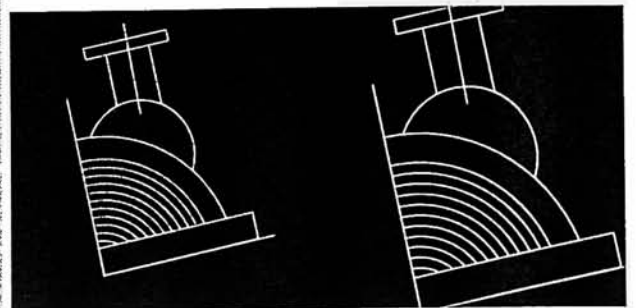


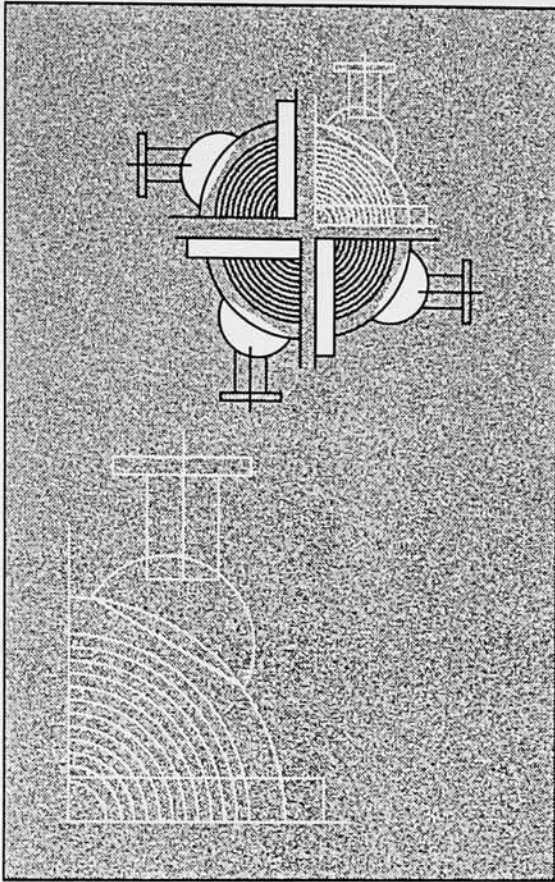
The following examples are a sampling of the many “thumbnails” created in developing the cover. They appear in chronological order and illustrate the trial and error process I went through in arriving at the final solution.



**SPIRAL PLATE
HEAT EXCHANGERS**

**SPIRAL PLATE
HEAT EXCHANGERS**





graham
Vacuum and Heat Transfer

Spiral Plate Heat Exchangers

Operation,
Maintenance
and
Installation
Manual

GRAHAM MANUFACTURING CO., INC.
20 Florence Avenue • Batavia, New York 14020

SPIRAL PLATE HEAT EXCHANGERS

Operation,
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and
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graham
Vacuum and Heat Transfer

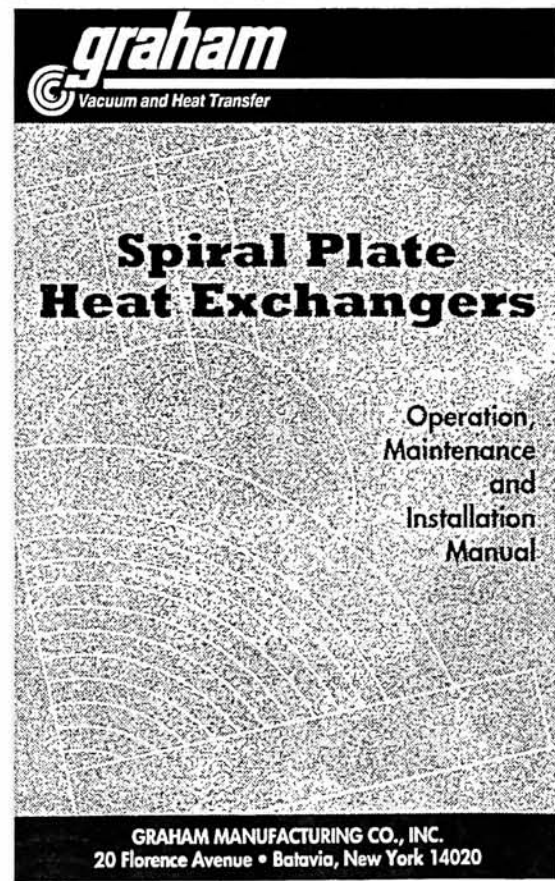
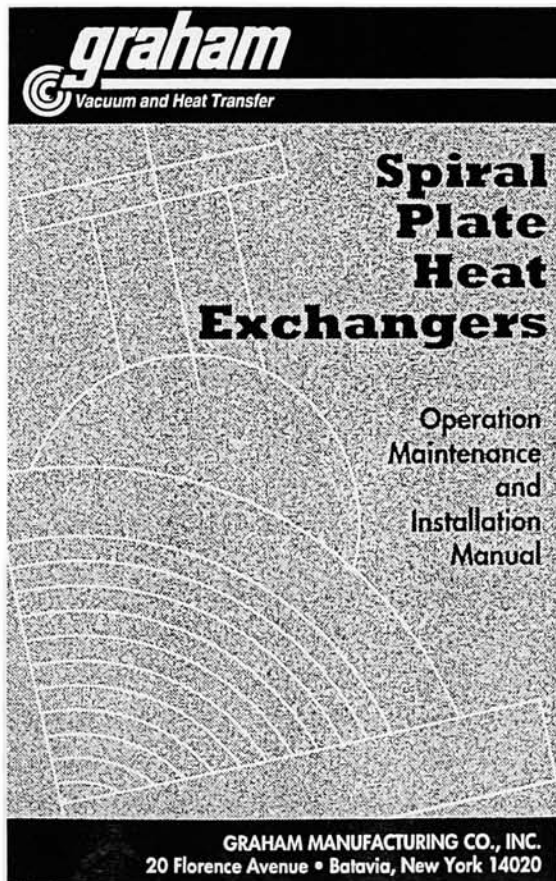
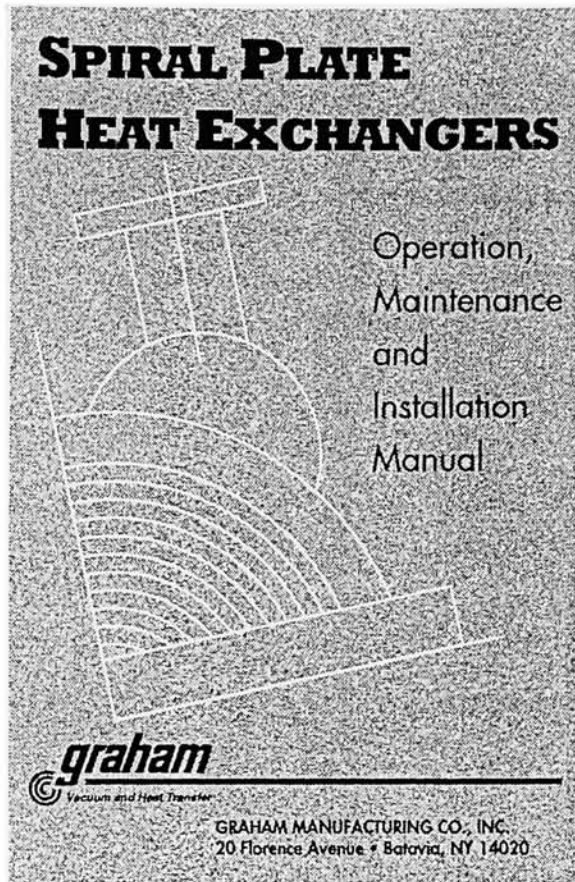
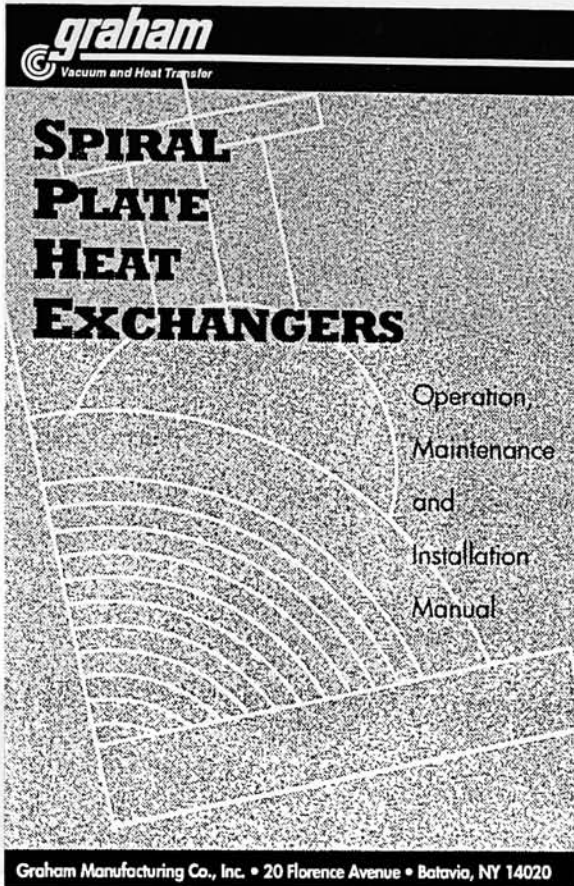
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graham
Vacuum and Heat Transfer

Spiral Plate Heat Exchangers

Operation,
Maintenance
and
Installation
Manual

GRAHAM MANUFACTURING CO., INC.
20 Florence Avenue • Batavia, New York 14020



FINAL REDESIGNED
MANUAL COVER

PART IV — RESULTS

As a whole, the five pieces which I redesigned were a dramatic improvement over the originals. They work well as a unit and also individually. They are not examples of graphic design or corporate design on the cutting edge but that was not my intention nor the goal of this project. Each is appropriate for its intended use, means of production and for the company for which they were intended. I think I was successful in finding that compromise between “conservative” and “new and different.” The other goals previously mentioned were:

- 1) Innovative
- 2) Professional
- 3) Fair Prices
- 4) Stand Out
- 5) Get An Edge On The Competition

I think it is safe to say that all of the pieces created reflect these criteria in a successful manner.

Spec Sheet

The final version of the spec sheet illustrates how even the most mundane and boring of printed materials can be improved without much effort at all. It successfully resolves the three main goals for a form; it is easy to read, easy to complete, and easy to retrieve information from. By the simple use of screens and rules, it is much more successful as a form than the original, making it easier for the user.

I did find, however, that Futura is not the most ideal typeface to use in a form such as this since it has extremely long descenders and ascenders on the lower case letters. Leading had to be increased to compensate for this since the letters were overlapping the rules. If you look closely you can see them touching in the rules in spots, even with the additional leading.

Application

Since the application and the spec sheet are both forms, the visual appearance and format reflects that. While they are not exactly alike, they are similar enough that they would be instantly recognized as forms rather than a memo or newsletter, etc. If this was a genuine corporate identity overhaul for this company, this could be realistic solution: All the forms are reversed on top with the same treatment of the logotype. Forms and only forms would have this characteristic feature.

The application is also an improvement over the original. All of the criteria which make up a successful form have been addressed; it is easy to read, easy to complete and easy to retrieve information from.

The other problems and weaknesses in the original that I wished to rectify were all addressed:

- 1) The new format is not awkward
- 2) It presents a more favorable image of Graham
- 3) Quality is greatly improved
- 4) It is more organized and uses less paper

The one major drawback to using PageMaker for such an involved form as this one is that it does not allow the user to group or lock items. You have to select each item individually in order to move them or bring them to front or send them to back. Since the type, rules and screened boxes are layered on top of one another, an inordinate amount of time was spent adjusting and readjusting each of these layers.

I knew that was the case before I started redesigning the application but I misjudged just how arduous a process it was going to be. I had briefly considered using Quark Xpress for this piece since you can group graphics and text in this program. I decided against it mostly because I do not know that program nearly as thoroughly as I know PageMaker. In retrospect, however, I think the advantage of being able to group graphics and text would have more than made up for my inexperience with the program.

Total Quality Management Update (TQM)

The new design of Total Quality Management Update encompassed all of the improvements I had determined as my goals:

- 1) It is more accessible to the employees
- 2) It looked like a quality product itself
- 3) It uses less paper
- 4) It is much improved visually
- 5) The copy is much easier to read without the justified type and rivers of white space
- 6) The format sets it apart from all of the other office memos

I went over to Graham one day when this thesis was near the end of its completion and spoke to the president of the company. I'll call him Mr. C. I asked Mr. C. to pretend that these were pieces that he had hired me to redesign and he was to tell me exactly what he thought. I was almost positive that the new Total Quality Management that I had worked up was the one piece he would really like. It turned out to be the only piece he really Disliked.

It was a very memorable meeting and it gave me a whole new — if not somewhat bizarre view of how upper management thinks. Although it was not what I expected to hear or what I wanted to hear at that point, it gave me some valuable insight that I had never found in all the books I consulted on corporate graphic design. The conversation on the subject of the TQM newsletter went something like this:

Mr. C.: "I don't like the new format because we post these and you could not hang this up easily...we use this format (trifold) for our medical plan information."

Me: "But don't you want all the employees to read this?"

Mr. C: "Yes, but they don't read the whole thing, they skim through it."

Me: "Don't you think that reading something on a wall is a little inconvenient?"

Mr. C.: "Maybe, but they just read the parts that interest them anyway."

Me: "OK...forget about the format, what do you think of the way it *looks*?"

Mr. C: "It looks good and that is not what we want to convey here."

Me: "But don't you think that a newsletter about quality should look like a quality product itself?"

Mr. C.: "We don't want to spend any more money on it."

Me: "But you could produce one like I did almost as cheaply, the only additional cost would be the additional paper."

Mr. C: "No, we don't want it to look professional. We want it to look like it was produced in-house."

Me: "But you could produce something like the one I did very easily in-house."

Mr. C.: "But it would look like we spent a great deal of money on it."

Me: "I don't get it."

Mr. C.: "The employees are always looking for ways to criticize how the company is spending money, especially now with the cutbacks."

Me: "But don't you think that the employees would appreciate the fact that it looks like you're spending money on them by improving *their* newsletter?"

Mr. C: "No."

Sales World

One of the biggest surprises I found was that the quality of the scanned images in the redesigned version of Sales World were an improvement over the original, despite the coarser dot pattern of my 600 DPI printer. I chose not to spend too much time on scanning since that in itself would be a long and involved project. I could have, no doubt, gotten even better results if I had the time to alter the scans and experiment with the screen used in printing them.

One of the most difficult things for me is getting blocks of different size type to line up correctly. I am embarrassed to admit that it was not until researching this thesis that I discovered it is a matter of simple math. For example, two lines of 6 pt. type set close will be the same depth as one line of 10 pt. type with 2 points of leading.⁷³ This knowledge was especially useful in working on the newsletter because there are a greater variety of type sizes used.

My biggest complaint is with the flag, which I think could have been stronger. While it is a more dynamic graphic treatment and an improvement over the original, I never managed to find what I considered the ideal solution.

As a whole, the newsletter is a much nicer looking and more functional one. The format is more modular than the original and less intimidating to the reader. It is new and different while still being conservative and professional — qualities they considered important. Its lack of color has not lessened its impact. The only additions I made were the pull quotes and the index on the front page, which gives busy readers a preview and hopefully gets them to look further.

I especially like the use of pull quotes which act as additional points of entry for the reader, attracting him or her to an especially interesting point. The use of white space also makes the copy that is there seem more important. Once again there is that “granite” pattern which provides a unifying element with the other pieces which were redesigned, along with the same Futura and Rockwell typefaces which were used throughout.

While I think the new version of Sales World is a big improvement over the original, Mr. C. disagreed with me. He insisted that the existing Sales World is “One of the best looking in the business.” His other argument was that it had to have color, they sometimes include charts and diagrams that they could not represent without color. While my feeling is that if used properly, screens could do the job just as well as color, he still disagreed and insisted they could not produce it without a second color.

Ironically, though, this was the last issue of “Sales World.” It has been discontinued indefinitely because of budget cut-backs. If it was produced in-house, as my proposed version could be at a fraction of the cost, it most likely wouldn’t be affected by such a cut-back. It would seem that a newsletter such as this should not be an on-again, off-again thing if it is to be taken seriously. If it is not affordable perhaps they should not have started it in the first place. By discontinuing this newsletter temporarily they seem to be saying that it isn’t worth the money. It also demonstrates in a very obvious manner that business is *so* bad that they can’t afford a \$700 newsletter. How people perceive the disappearance of this newsletter certainly won’t be in a positive light.

Spiral Plate Manual

Mr. C.’s comments on my new version of the manual were all positive. He liked the format very much since it looks much better than the old one and is easy to understand. He liked the typefaces since they are clean, clear, and easy to read. He also liked the overall appearance since the former version was very outdated.

Personally, I agree with Mr. C. Since the original manual is so bad, it would not have taken much to improve it dramatically. All of the major problems with the original were addressed and resolved satisfactorily. The format is more appropriate for its intended purpose – reference. It is designed for random access as opposed to continuous reading.

The only questionable factor is that the pages all bleed and that would not be the most practical way to produce this manual. Since neither a laserprinter or copier usually print from edge to edge, I had to print the pages to larger size paper to get the bleed effect. My reasoning was that in order to produce a number of copies, the master could be done in-house and they could be reproduced inexpensively on a copier and the edges then trimmed. The other, and more practical, option would be not to bleed the rules off the edge. It would be very simple to do this by simply changing the rules once on the master page. The cover would have to be altered slightly also. Although I much prefer the bleed effect, I do not think the manual would suffer tremendously without it.

Concluding Remarks

I remember the first time I ever saw a Macintosh back in 1986. I thought it was the strangest computer I had ever seen. I never imagined then just how much that little machine would revolutionize the graphic design industry or what a profound effect it would have on me personally.

The most difficult thing for me throughout this project was having to work on an SE, an antique as far as Macintoshes go. The SE has only the minimum configuration to run the programs I used, not to mention the slowness of the 68000 microprocessor. Needless to say, it was very slow going. On one hand I think I would have been more productive and the end result would have been better had I used a faster, more capable Macintosh (which I could not afford.) On the other hand, the SE was a very realistic handicap since financial limitations are an unfortunate reality in the business world, as I have discovered with every job I have had that involves Macintoshes.

What used to be the domain of the graphic designer is now in the hands of anyone with a computer and printer. However, there is no substitute for experience and training and so it is doubtful that graphic designers will become extinct. The role of the graphic designer has changed and will continue to change as a result of technology and, in particular, the Macintosh. It is up to the designers to determine their role in this new age and to adapt to this new technology in order to create new forms and ways of expressing ideas.

Notes

¹Rose DeNeve, Corporate I.D. Systems (Cincinnati, OH: North Light Books, 1992), p.4.

²Phillip B. Meggs, A History of Graphic Design (New York, NY: Van Nostrand Reinhold Company, 1992) p. 425.

³ Ben Rosen, The Corporate Search For Visual Identity (New York, NY: Van Nostrand Reinhold Company, 1970), p. 1-3.

⁴James Pilditch, Communication By Design: A Study in Corporate Identity (Berkshire, England: McGraw-Hill, 1970), p. 3.

⁵Wolfgang Schmittel, Process Visual (Zurich, Switzerland: ABC Edition, 1978), p. 22.

⁶Rosen, p. 2.

⁷Meggs, A History of Graphic Design p. 471.

⁸Michael Gosney, Linnea Dayton, Verbum Book of Digital Typography (Redwood City, CA: 1991), p. 1-3.

⁹Daniel Sitarz, Desktop Publisher's Legal Handbook (Carbondale, IL, 1989), p. 14.

¹⁰David Collier, Bob Cotton, Basic Desktop Design and Layout (Cincinnati, OH, 1989), p. 28.

¹¹Joseph Müller Brockmann, Grid Systems In Graphic Design (Niederteufen, Switzerland: Arthur Niggli Ltd., 1981), p. 7.

¹²Ronnie Shushan and Dan Wright, Desktop Publishing By Design (Redmond, WA, 1989), p. 42.

¹³Philip B. Meggs, Type & Image (New York, NY: Van Nostrand Reinhold, 1992), p. 88.

¹⁴Fernand Baudin, How Typography Works and Why It Is Important (New York, NY: Design Press, 1988), p. 17.

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- ¹⁵Michael J. Sullivan, "Flexible Frameworks," PUBLISH, September, 1990, p. 75.
- ¹⁶Collier, p. 28.
- ¹⁷Meggs, Type & Image p. 17.
- ¹⁸John Miles, "Watch Out for Widows," PUBLISH, March 1990, p. 33.
- ¹⁹Baudin, p. 9-13.
- ²⁰Jim Heid, "Desktop Publishing Techniques," MACWORLD: The Macintosh Magazine, August 1992, p. 203.
- ²¹Jim Heid, "Top-Notch Type," MACWORLD: The Macintosh Magazine, October, 1991, p. 133.
- ²²Collier, p. 34.
- ²³Collier, p. 7.
- ²⁴Michael Gosney, John Odam, Jim Schmal, The Gray Book: Designing in Black and White on Your Computer (Chapel Hill, NC, 1990), p. 52.
- ²⁵Michael Beaumont, Type Design, Character & Use (Cincinnati, OH, 1987), p. 126.
- ²⁶Shushan, p. 196.
- ²⁷Sandi Baker, Carl Ballay, Angie Martinson, "Strong Foundations," PUBLISH (September, 1990) p. 93.
- ²⁸Gosney, p. 46.
- ²⁹Collier, p. 28.
- ³⁰Beaumont, p. 68.

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