

Using SHOTS

There are many times when training on a press is not feasible or practical. The Sheetfed Offset Training Simulator—SHOTS—is a highly integrated, interactive software package used as a training system for press operators. SHOTS is used to teach graphic arts personnel or students how to recognize, analyze, and correct print problems. The program simulates the operation of a sheetfed press (two- or six-color) where any changes to the press are reflected in the simulated print copy. The latest version—4.0—has additional features.

SHOTS is used by over 125 schools and printing facilities for training. GATFWorld asked several different types of organizations to tell us about how they use the simulator and the resulting benefits.

SHOTS

To order a SHOTS, contact Jim Workman, Director, GATF Training Programs at jworkman@gatf.org or 412-741-6860 ext. 111.

SHOTS at Printing & Imaging Industries of Maryland

by Russ Hewitt, Member Services

Printing & Imaging Industries of Maryland (PIM) had one goal in mind when its board voted unanimously in the fall of 2001 to purchase the Sheetfed Offset Training Simulator (SHOTS) printing simulator by Sinapse Graphic International—to provide a state-of-the-art training tool for its members.

Like the printing industry nationally, PIM's membership is composed mostly of small printing companies—approximately 80% of our members have twenty or fewer employees. Smaller companies traditionally do not have the resources to provide ongoing, in-house training, and the Baltimore region lacks certificate and degree programs in printing at the post-secondary level. The alternative for our members has been to send employees out of state for training, bringing in outside trainers, or luring experienced operators away from other companies to avoid the need to provide training. Noting this press training void, PIM decided to take a bold step in purchasing the



SHOTS system to fill the education gap.

As an association, PIM is constantly trying to increase the value of membership, especially during these challenging economic times. "It is always difficult to put a dollar value on so many of the services that PIM provides to members, such as our government affairs activities, since they have a very discreet impact on companies' balance sheets. When we can provide tangible tools like the SHOTS simulator that have a measurable impact on a company's bottom line, members can clearly see a real value of their membership dues," says Art Stowe, president of PIM.

The Association plans to rent the simulator to members at a very affordable rate for two-week periods. We provide a full day of training for the individual within the company who is the designated in-house trainer. The ideal person is usually a supervisor who has experience operating an offset press, basic computer skills, and the desire to upgrade the skills of his/her staff.

We recommend that the trainer perform an initial assessment of the personnel to be trained on the



SHOTS contestants ponder and troubleshoot a press problem.

simulator. This can be done through a combination of on-press evaluations and simulator exercises. The next step is to either develop customized training exercises or use those supplied by GATF. Each exercise can be tailored to address the specific skill that a press operator needs to improve.

As part of our marketing efforts to familiarize members with the SHOTS system, PIM held a press skills competition using the simulator, "The PIM Press Olympics." Member companies sent press teams to PIM to compete using SHOTS, and the PIM awarded the "Best Maryland Press Operator" award to the winning team. Articles on the SHOTS system appear regularly in PIM publications, and the simulator was featured on display at a recent membership dinner meeting attended by more than 150 members. PIM is confident that once members become aware of the potential of this innovative training tool, rental of the system will be in high demand.

PIM has already been approached by web press member companies about the possibility of PIM purchasing the heatset and cold web offset versions of the simulator that are now available. Paper and ink suppliers have also expressed interest in using the simula-

tor as a way of demonstrating concepts to customers without having to be in the actual pressroom. An added strength of the SHOTS system is its use of digital photography or video clips. Users can easily incorporate their own digital images into the training exercise files.

A small but growing number of PIM members have used the SHOTS system, and several have approached the Association about renting it on a regular basis. John Snyder, HBP Inc., in Hagerstown, Maryland, was one of the first member companies to try the simulator. "It's a great tool for us because we run more than one shift and have a hard time providing training evenly across shifts. This way, we can schedule training at a convenient time and communicate the same concepts to all of the press crews without them being at the same training session. We have even identified some up-and-coming pressmen at our company by testing them on the simulator. I see us using the simulator several times a year," says Snyder.

PIM has embraced the recent merger of PIA and GATF with open arms. GATF's training and technical services are a welcome addition to the already plentiful PIM and PIA service

offerings. The SHOTS simulator will serve to raise awareness of the Sheetfed Training Curriculum that GATF offers. As members become more comfortable performing training on the SHOTS system they can begin to integrate parts of the Sheetfed Training Curriculum into their lesson plans. Utilizing the SHOTS system is a small yet integral part of the entire sheetfed training program that PIM is endorsing to its members. "While we would like to have additional hands-on press training available locally for aspiring pressmen and those looking for upgraded training, we feel that the offerings that PIM and PIA/GATF currently offer are more than adequate. The challenge that we face as an association relates to marketing what we already have," says PIM's Art Stowe.

As the printing industry evolves, so must the training tools used by our members. PIM is gearing up to meet those needs. Education and training has always been one of the strengths of our Association, and we believe that the SHOTS system enhances our education offerings, making PIM an even better value to our members.

Printing & Imaging Industries of Maryland is on the web at www.printmd.com.

SHOTS at Edwards Brothers

by John Welton, Manufacturing Manager, Edwards Brothers, Inc.

Edwards Brothers, Inc. decided to purchase the SHOTS system for many reasons. Over the last several years, we have dealt with employee turnover due to a competitive job market. Combining this problem with modest growth and many new press installations, we needed to advance our training programs to a new level. After attending a training session at GATF, I was introduced to the SHOTS system, and we decided this could give us a tool that would enhance not only our training program, but also fine-tune current operators.

Once we made the decision to purchase the SHOTS system we needed to identify the trainers. We made our choice for this by looking for individuals who were computer literate and had significant ties to our pressrooms. We decided on both midnight shift supervisors in each plant—Cheryl McAllister in Ann Arbor and George Hart in North Carolina. Both have done fine jobs in the beginning stages of implementing their system and both trainers attended the SHOTS training class at GATF.

While Edwards Brothers, Inc. has been known as a quality book manufacturer for well over one hundred years, the science of printing could be a real value if understood more in-depth. The value of this knowledge would improve many of our goals in our pressrooms. Productivity, shorter makereadies, and reduced waste would definitely be impacted in a positive way if these skills could be taught to our operators.

We started our training program by assessing the skills of all of our current operators. A series of problems were developed by our trainers to do the assessments. These assessments will be followed up on, based on results, to improve skills in certain areas where there is opportunity for improvement.

As far as developmental purposes are concerned, we will be customizing a training course for all press helpers to complete. We will tie this training to promotional opportunities to ensure the use of the SHOTS system.

We also will use the SHOTS system as an ongoing training and troubleshooting tool for experienced operators. We are planning to design a competitive series of problems to solve in group settings to make the use of these tools both challenging and fun.

Edwards Brothers, Inc. is proud and excited to have the latest technology in regards to press training. We see these tools as a long-term investment that will take our pressroom to the next level of quality, production, and reduced waste.

Edwards Brothers, Inc. is a producer of short and medium run books and journals for publishers, authors, scholarly societies, industries firms, colleges and universities, and other customers, and is headquartered in Ann Arbor, Michigan. For more info visit www.edwardsbrothers.com

SHOTS at Ryerson University

by Manfred H. Breede, Professor, Ryerson University, School of Graphic Communications Management

The four-year Bachelor of Technology at Ryerson University's School of Graphic Communication Management (GCM) provides students with a comprehensive theoretical and practical grounding, encompassing all facets of the printing industry. The expressed aim of the program is "to graduate individuals who will become effective professionals in the printing industry and who will have a foundation upon which they may develop themselves as managers." This is accomplished with a mix of business, technical, and liberal arts courses, with the technical and business courses about equally distributed.

The current total enrollment is 341 students and the expected first-year enrollment for the next academic year is 139 students. Our incoming students typically have no prior education in printing press technology, so we start with the very basics of press terminology and technology.

The first Sheetfed Offset Training Simulator (SHOTS) installation dates back to 1998. GCM was one of the earliest adoptors of computer simulation training. Since that time one additional SHOTS and one flexography simulator, called FlexSys, has been added.

The First Year

To a large degree the simulators are used in a self-instructional environment. This is done in conjunction with study guides prepared by the instructors to give students the direction

needed to achieve the course objectives. Once they have learned to navigate the press and obtain general knowledge of its parts and functions, the learner advances to the next step, to gain a knowledge of the cause-and-effect relationship of press controls and press output. With three simulators shared by thirty students, group work is virtually mandatory but also students have twenty-four hour access allowing them to explore at their own pace.

Again, students follow the directions in the study guides. For example, a student may explore the cause-and-effect relationship of opening or closing ink fountain keys, metering too much or too little fountain solution to the dampening system, or moving printing cylinders in lateral or circumferential directions. The effects can either be observed on the monitor displaying the press sheet, by narrative information stating printing problems, or by instrumentation such as a densitometer, glossmeter, and loupes.

At these levels of learning I would rate the simulator approach higher than real press training. My opinion is based on test results of my students over a period of five years. It goes without saying the simulator approach is infinitely more cost effective than the live press approach.

In terms of technical learning objectives, solving printing problems ranks the highest, because the prerequisite for problem solving is an understanding of printing press technology; associated chemical, physical, and environmental factors; as well as the materials consumed in the process.

The Second Year

At the beginning of the second year our students are usually ready to begin the process of printing problem solving. By this time they have mastered how to manipulate the press and know all operational functions. The lecture component of the printing processes course deals specifically with the major printing defects, their underlying causes and possible solutions, thus



Bill Farmer, GATF Technical Consultant, monitors SHOTS runners-up Buzz Lee and Glenn Little of Colorcraft of Virginia, Inc.

giving them the necessary knowledge set for printing problem solving.

At this particular juncture the SHOTS scenario generator comes into play and is used to create any conceivable printing job problem or problems. Here the technical insight and teaching strategy of the instructor is of utmost importance, because the problems created must be based on sound technical reasoning, solvability, and the course material content.

Feedback as to the effectiveness of a learner's actions is handled by a dialog box, where every action taken by the user is recorded and can be verified by the instructor. The latter feature is particularly valuable because it allows the instructor to evaluate a student's approach to problem solving with respect to methods, organization, and efficiency.

My evaluation of the problem solving aspect of press simulators is as follows. On the positive side, the activity of solving problems based on one's understanding is always a desirable goal in teaching, and the simulator does require students to take a methodical approach to problem solving based on technical reasoning. On the negative

side, the simulator tends to give students the impression that press problems can be solved with a clinical efficiency that does not exist in the real world. Real press problem solving is a much more painstaking process than the students are led to believe, and it can be tedious, obscure, and physically demanding.

Experienced press operators learn to solve printing problems as they occur over long periods of time. Teaching problem solving on a real press is not always viable or even possible, because of the high costs of staging some problems and the unpredictability of many printing problems. Considering these real press limitations, simulators, though not perfect, are a good alternative and raise learners' awareness of a printing process's complexity.

Costing Function in SHOTS

While focus on the technical aspects of printing is important, printing is still a business that has to generate profits to be a viable enterprise. This is where the costing feature plays a valuable part in the education of students.

The cost information feature lets the user adapt the simulator to different press configurations according to six criteria: (1) press hourly costs; (2) costs of raw materials, i.e., paper, ink, etc.; (3) time spent accessing parts of the press; (4) time spent checking for problems; (5) time spent remedying a problem; and (6) material cost of remedying a problem.

These points demonstrate that in order to make realistic cost estimates, both material consumption and technical factors have to be considered and understood. These factors are learned in a variety of different courses and can be applied meaningfully in press simulator exercises. For example, press makereadies and runs could be analyzed from the perspective of press hourly cost rate calculations based on the concepts of fixed and variable charges and cost of materials could be linked to the interpretation of price lists, both learned in estimating courses. Press problem cost analysis, i.e., changing a smashed blanket, could be based on material learned in print technology courses.

Preparing Students to Be Managers

Because GCM prepares students for management positions in the printing industry, Ryerson has sought ways to adapt SHOTS for meaningful management activities. We created exercises designed to determine the cost effectiveness of printing press accessories by way of a time and motion study. The simulators were not explicitly designed for such an exercise, and the management applications are strictly a liberal adaptation to satisfy the particular requirements of my students.

Real time and motion studies are tedious because someone has to time an activity and do so repeatedly over a long period of time to arrive at reliable averages. Press simulators overcome these impediments because a given activity or an entire pressrun can be executed in virtual time, which can be

adjusted to any time compression desirable without consuming any materials.

The press simulator exercises I have devised involve two time studies for a four-color process job. The first job is performed by manually adjusting the ink fountain keys based on the operator's visual assessment for ink requirements in each ink zone and color unit. The second job is done with a pre-calculated ink film profile obtained from a plate scanner which has subsequently been released to the ink fountains of the press.

The underlying assumption of these exercises is to demonstrate that automatic press accessories, such as plate scanners, are in fact saving time and materials because of a quicker press makeready phase and the associated waste reduction in attaining the required color balance with fewer press sheets. The potential economic viability of such equipment is calculated in a payback analysis of time and material savings. Similar exercises are possible on the simulator for other accessories, such as scanning densitometers vs. handheld densitometers, automatic blanket washing devices vs. washing the blankets by hand, or the economic advantages of faster vs. slower presses.

The main purpose of these exercises is to provide students with the opportunity to practice the procedures and concepts of evaluating the economic benefits that equipment acquisitions may or may not have and prepare them to make equipment acquisition decisions based on analytical and methodical procedures.

Final Comment

Using press simulators for some five years now, I can state with some confidence that their introduction into our curriculum has enhanced the learning experience of our students. More specifically, students are now having a much greater exposure to press manipulation and especially problem solving than was possible, when our only option was the actual press equipment. However, I am also of the firm belief that operating a press could no more be learned by training on a simulator exclusively, than flying could be learned by only training on a flight simulator. Our particular program objectives lean toward the management aspects of the printing industry, and the skills required for hands-on operation of a press is less important than the understanding of how presses function; therefore, press simulators are especially appropriate for us.

For information on Ryerson University, Toronto, Ontario, Canada, visit www.ryerson.ca.

SHOTS Press Skills Contest at GATF/PIA • NAPL Sheetfed Pressroom Conference

This contest—sponsored by MAN Roland—gives printers the chance to prove they are the finest troubleshooters in the land. Contestants—only 32 are allowed to compete—are asked to ferret out the problem and match the proof with the lowest production cost. The top two contestants advance to the finals, held in front of the assembled attendees at the conference.

The winner receives a plaque, free registration to the 2004 conference, a case of French wine (courtesy of Sinapse Graphic International, the Paris-based developer of SHOTS), and lots of publicity. Past winners are Robert Romero of Paragon Printing and Mailing, John Johnson and Anthony Bonds of the Smyth Companies, Mark Lockary and Nader Mehdizadeh of California Lithographers, and Fran Yeager of Great Plains Packaging.

To be one of the 32 contestants and register to attend the Sheetfed Pressroom Conference visit <http://www.gain.net/conference/brochure/index.cfm?ConferenceID=192>.