

# GP Experience Summary

## **Plant Start-up**

### **Philip Morris**

#### **The Philippines and Brazil**

The opportunity identified was to provide the tools needed to ensure a successful start-up of two new plants, one in The Philippines and the other in Brazil. The initial focus of the project was with Philip Morris Central Engineering Group in Richmond, the division responsible for providing overall design, installation, and startup support for international plants. Two training developers worked closely with the Philip Morris engineers to develop process overviews and on-the-job training guides for operating the tobacco processing plants. To ensure local ownership, train-the-trainer instruction was provided to six representatives from The Philippines and Brazil plants. These trainees used the developed materials to instruct their associates in the new plants, resulting in a very successful start-up.

The project started with a Front End Analysis to define the workforce preparation needs to start-up the new NET-SCI tobacco processing plant for Philip Morris in The Philippines and Brazil. These techniques were also applied to the technology using the Cast Leaf process. The recommendations from the Front End Analysis were utilized to provide documentation and train-the-trainer services to support the start-ups in The Philippines and in Brazil.

# GP Experience Summary

## **Workforce Selection and Preparation Navistar Plant Start-up Monterrey, Mexico**

This Navistar project involved the full breadth of preparing and developing the new organization by including selection and assessment of the workforce for the new plant being built in Mexico. During the selection phase of the project, the team methodically interviewed and tested every candidate for experience and knowledge. The team then evaluated the candidates' skills and abilities on a mock-up door assembly where production personnel must assemble and disassemble the doors using written work instructions. After successful completion of this phase, job "scholarships" are extended to trainees who then enter the GP technical training curriculum. Only after the candidates successfully completed the technical training and are certified by GP, did Navistar hire them as regular, full-time employees.

GP designed and developed the documentation and training for the production and maintenance workforce at Navistar. The documentation included system overviews, detailed equipment descriptions, production and maintenance procedures, and practical exercises. GP also managed the efforts of the Original Equipment Manufacturers (OEMs) in their delivery of documentation and training. A senior GP engineer specified the content, training material format, and instruction the OEMs delivered and then evaluated their performance and delivery at key checkpoints. By GP managing the OEM development process, Navistar received a more integrated and seamless training curriculum.

Implementation of the training was delivered through 640 hours of classroom and on-the-job training. Using a team of eight Spanish-speaking instructors in Monterrey, this group ensured the proper translation, administration, and delivery of all training for Navistar. The group also provided on-the-job coaching and train-the-trainer instruction. The training programs will be turned over to Navistar personnel. The end result was a very successful start-up of the plant to full production.

# GP Experience Summary

## Launch Training and Documentation Relocation of Delphi-Saginaw's New *Innovate* Manufacturing Lines Queretaro, Mexico

The Delphi-Saginaw's new *Innovate* Manufacturing Line was relocated from an existing facility in Queretaro to a brand new building. As part of the launch support, the project team assessed the knowledge and skills of 250 existing production and maintenance employees in order to design a pay-for-skill and multi-skill training program. Integral to this effort, are the On-Job Training Guides developed to specifically address requisite job duty skills and qualifications necessary to support the pay-for-skills program. This guide mapped all training and documentation to the job duties.

Systems and equipment documentation were also part of the launch support. GP developed system overviews, detailed equipment descriptions, production and maintenance procedures, and work instructions to support the production and maintenance job duties. The team also managed the efforts of the Original Equipment Manufacturers (OEMs) to provide documentation and training to Delphi-Saginaw. A training specialist specified the content and format of the documentation and training the OEMs delivered, and evaluated their performance and delivery at key checkpoints. By managing the OEM development process, the Alliance team ensured that OEM reference materials and instruction were easily mapped into the overall pay-for-skills training program.

Implementation of the training was conducted for 250 employees working through 480 hours of classroom and on-the-job training, using a team of four Spanish-speaking instructors in Queretaro. This group ensured the proper translation, administration, and delivery of all training for Delphi-Saginaw. They also provided on-the-job coaching, equipment, troubleshooting, and systems diagnostics. At the key delivery phase of the project, Delphi-Saginaw re-evaluated their efforts for production in Queretaro and decided to cease production efforts.

# GP Experience Summary

## **Documentation and Training Support Start-up for Amoco Galeota Point, Trinidad**

The scope of this project was to develop and deliver operator training to Amoco Trinidad Oil Company (ATOC) to support start-up of their liquid natural gas (LNG) upstream condensate plant at the Galeota Point oil terminal. The concerns included the new equipment and systems, but also the technology transfer of information over such a large distance and between different cultures. Project developers worked closely with Fluor Daniel engineering and construction personnel to document the processing, storage, and shipping areas associated with the LNG facility. The development effort focused on Houston where the bulk of the engineering work was performed. Engineers were interviewed, P&IDs reviewed, and control hierarchies documented. Training engineers developed text-based equipment descriptions and procedures to document on-the-job training guides for the operators, and took advantage of computer-related technologies to develop process overviews. The original Cad Cam drawings developed by Fluor Daniel were compiled and animated to provide computer-aided overviews for training the operators on the flows and chemical processes occurring in their unit. The instructor has the ability to show flybys of the facility, detailed cutaways of columns, and rerun flow paths off the columns. System walk-downs can be performed in the classroom while construction and vessel hydros are being performed on the real equipment.

The GP team members also managed the efforts of the equipment suppliers in their delivery of documentation and training. A senior GP engineer specified the content, training material format, and instruction the supplier will deliver and coordinates this training into the overall systems-level training being developed by the project team. The project focus shifted to Galeota Point in Trinidad for final validation of all procedures and work instructions. Delivery of the training was done at the Trinidad location.

# GP Experience Summary

## **Launch Training Start-up for Accuride Columbia, TN**

The goal of this project was to duplicate the good work processes already in place in one location and bring them to the new plant. A Front End Analysis was performed to define the workforce preparation needs to improve the performance of production and maintenance personnel at the existing Henderson, Kentucky facility. The recommendations and proposed training plan was then implemented to support the new facility start-up in Columbia, Tennessee. The scope of work at the new Columbia plant included workforce selection, start-up training, and engineering management.

Two engineering managers were placed onsite to coordinate overall engineering efforts for Accuride. Two training developers designed and developed computer-based overviews, equipment descriptions, system procedures, and work instructions. The team used Original Equipment Manufacturers to further identify specific equipment processes and used the Accuride pilot facility in London, Ontario to capture work processes. Cross training of the production and maintenance personnel was an integral part of this project.

The results included a successful start-up of the new plant, and also provided opportunities for improvement at the existing plant. This gave more ROI than ever anticipated.

# GP Experience Summary

## General Motors Power Train (GMPT) Plant Launches Worldwide

GM Powertrain Group is a global organization consisting of North American, Asian and European based manufacturing and engineering sites. At any one time General Motors Power Train (GMPT) develops and designs new products, launching new products and processes and upgrading systems. Many of these projects require the training and retraining of the engineering, manufacturing, line and support organizations. Through the use of the GMPT 4-phase product development process and the GMPT Launch Training Model, GMPT has identified the elements, structure, tools, systems and processes required to successfully provide the training support throughout these cycles. The requirements associated with the training for these projects often exceed the capacity of the existing site resources. To ensure successful ramp-up within the target time frame and budget, GMPT selected GP to assist in the global implementation of the 4-phase process.

GMPT was looking for a “global partner” such as GP to share in the risk and reward of a long-term relationship. GP is expected to work with GMPT to identify and solve processes and technological issues. GP was chosen because of our skilled personnel and resources, and the ability to provide on-site assistance in accomplishing the tasks defined by the “GMPT Core Launch Team” and plant site management during training volume increases.

GMPT facilities and projects are worldwide and have selected GP because of this flexibility and ability to develop and supply resources. GMPT selected GP for their ability to supply overseas resources that are fluent in local language and culture. GP was selected because we are a company that has capable resources located across the world.

GP Site Managers are based on-site in Defiance, OH; Flint, MI; Bay City, MI; Kaiserslaughern, Germany and Szentgotthard, Hungary. GP site managers are oriented to GMPT 4-phase and Launch Training common processes. GP site managers are co-managed by the GMPT Launch Program Training Managers, the site project manager, plant manager, and a GP project lead. This assignment will last 1 to 3 years, and will be overseas and at any one time GMPT has 4-5 of these potential needs or opportunities.

GP site managers will support the day-to-day management and administration of activities related to training of the site population affected by launch. Different project launches may be taking place in 2-3 facilities simultaneously, but not necessarily on the same timing scale. The activities which take place at each site may include, but is not limited to: responsibility for management of training requirements related to the launch including OEM purchased training, new work practices, new work process training and additional organizational imperatives. GP is required to analyze current training

# GP Experience Summary

## **General Motors Power Train (GMPT) Plant Launches Worldwide (continued)**

organizational structure, integration of this specific launch and its requirements into the current structure or strengthening the current structure with the tools and processes found in the 4-phase process.

In a large-scale launch at a plant site, the training population will include all employees, hourly and salaried, who are effected by the new process, product or technology. The GP site manager is expected to work with any current site training organization; the local leadership, the site program manager and the GMPT launch program-training manager.

The overall project is jointly project managed by GMPT and GP. Site training management is accomplished by following the model and is the responsibility of GP site managers. The GP project leader is responsible for budget, resources on all sites and reports to GMPT on a monthly basis.

Each site manager will be responsible for keeping within training budget and timing parameters, responding in a timely manner to customer needs and providing leadership as well as administrative assistance.

# GP Experience Summary

## **Plant Start-up DuPont Hytrel Charleston, SC**

The overall objective of this project was a well-trained workforce to start up the Hytrel plant, on schedule with zero incidents.

A Front End Analysis was done to define the workforce preparation needs for DuPont to support a successful start-up of a new Hytrel plant in Charleston, SC. Front End Analysis is a systematic evaluation of the organizational and human resources issues required for new facilities. The approach integrates organizational design, including organizational structure, and work design, with identification of required job knowledge and skills for safe and efficient plant operations.

The analysis was used to determine employee assessment and selection criteria, pay and compensation systems, and team and technical training for production, maintenance, and management personnel. The project included 530 policies and procedures, all focused on enabling the new workforce to accomplish an efficient plant start-up with reliable operations. The training program encompassed 630 hours of classroom and 93 hours of practical work. Databases for training records management and document control are used to track individual development and progress along expected performance criteria.

The project included classroom instruction, plant-floor coaching, and on-the-job mentoring. Train-the-trainer was provided to ensure the DuPont staff was fully prepared to take over the training on a long-term basis.

# GP Experience Summary

## **Start-up National Steel Galvanize Line Great Lakes**

National Steel constructed a new, continuous hot-dip galvanizing line at the Great Lakes Division location in Ecorse, Michigan. This was the first hot-dip galvanizing line at this location. The personnel that manned both the maintenance and operations positions at this new facility had little or no hot-dip galvanize line experience. The majority of the personnel had some steel production related experience at other production lines at the Great Lakes facility. National Steel selected GP to provide the support required to ensure that their personnel are prepared to operate and maintain the equipment.

Based upon the lack of hot-dip galvanizing experience of the operators, a significant training effort was required to ensure a successful start-up and ramp-up to forecasted production targets. NKK-SE (along with sub-vendors) provided an extensive equipment-specific training program (classroom and in the field hands-on) for both operators and maintenance personnel. However, to maximize the value of the OEM-provided training, it was necessary to raise the baseline level of knowledge of the personnel prior to this training. Development and implementation of theory, process line operations, and mechanical/electrical fundamentals training programs targeted to the hot-dip galvanize line process accomplished that requirement.

GP designed, developed and conducted over 556 hours of training, including courses such as Galvanizing Line Theory, Line Operation, Galvanizing Line Electrical Distribution, Temper Mill Overview, Robotic Skimmers, Galvanizing Line Overview, etc. GP provided over 80 man-weeks of support to develop operating procedures (SOP's), Maintenance Procedures (SMP's) and Operator/Maintenance On-the-Job Training Activities (OJT). Additionally, GP worked closely with National Steel and their equipment vendors to ensure the training, the procedures and the documentation delivered to National Steel was correct, clear and easy to use.

# GP Experience Summary

## Start-up of New Galvanizing Line

### Dofasco/Solac

### Ontario, Canada

Dofasco (80%) and Solac (20%) are partners in a new galvanizing line constructed at Dofasco's Hamilton, Ontario facility. GP provided a variety of training-related services to support the start-up of the new line. These services included the following:

- On-site training coordination services
- Operations job and task analysis
- Galvanizing line theory and overview training development and course conducts
- Basic mechanical training curriculum development and course conducts for operations personnel
- Basic electrical training curriculum development and course conducts for operations personnel
- Equipment-specific electrical maintenance training development and course conducts
- Operations job task certification curriculum development
- Operations procedure writing support
- Operations on-the-job training support during commissioning

GP provided on-site project support to ensure consistency between GP and OEM training activities for the project. The on-site support included scheduling, record keeping, and coordination of data gathering and materials reviews.

GP conducted a job and task analysis (JTA) for the operations job positions and developed a task-based certification curriculum founded on the results of that analysis. The certification curriculum is designed primarily in a self-study format supported with on-the-job (OJT) guides. GP supported operator OJT and is providing personnel to support certification activities during line commissioning. The basic mechanical and electrical curriculums for the operators are designed to raise their base skill and knowledge levels in those areas to support basic maintenance and troubleshooting responsibilities. Using the same data from the JTA, GP developed operations procedures for the new line.

# GP Experience Summary

## **Start-up of a Greenfield Galvanized Rolled Steel Mill GalvPro, L.P. Jefferson, IN**

GP supported the start-up of a Greenfield mill for galvanizing rolled steel products at GalvPro in Jefferson, IN. GP designed and managed a comprehensive, multi-phased training program for new employees at GalvPro, based on a systematic approach to training (SAT) methodology. GP performed a needs analysis, which resulted in a comprehensive training plan. The training plan provided strategies and schedules for the subsequent design, development, and implementation of training. This comprehensive training plan included:

- Employee Orientation
- Safety
- Team Skills
- Mobile Equipment
- Galvanizing and Process Theory
- Quality (including ISO-9000)
- Line Operations Training
- On-the-Job Training (OJT)

GP designed, developed and conducted these training programs for all mill staff. Using the data from the needs analysis, GP also facilitated development of work flow diagrams, control plans, Quality Standard Operating Procedures (QSOP's), and failure modes and effects analyses (FMEA's). GP trained the mill operations personnel to write and revise operating procedures, resulting in a mill staff that was well prepared for start-up. GP also coordinated and conducted Original Equipment Manufacturer (OEM) training for operations and maintenance personnel.

# GP Experience Summary

## World Class Start-up AK Steel Selects GP Rockport, IN

Early in 1997, AK Steel Corporation began work on a planned \$1.1 billion state-of-the-art manufacturing facility in Rockport, IN. The plan was to staff the plant with new hires from the local area and to begin production within a very short 12 months from the time of recruitment. To help meet this demanding schedule, AK Steel turned to GP to conduct employment recruitment, assessment and training for shift managers, technicians and maintenance staff. The start-up schedule required close synchronization to move applicants through recruitment, assessment, selection and training. While the rapid start-up schedule was a challenge, the major challenge was how to prepare new employees to work with equipment and processes that didn't yet exist. Plant construction and the building of equipment would occur at the same time as recruitment and training.

### The Solutions

Managers and maintenance staff could be expected to bring most of the skills they would need with them. They simply needed orientation to get up to speed on AK Steel's requirements. Production technicians, however, would need equipment and process specific skills to do their jobs effectively. While exact specifications for technicians did not yet exist, GP developed a profile for technical skills, based on the experience in other AK Steel manufacturing operations and a comprehensive assessment as to what competencies would be needed at the new plant. This analysis was used to identify the entry-level skills prospective technicians would need, computer-based assessments, simulations and behavioral interviews to assess applicants were used to determine:

Adaptability	Positive Attitude
Attention to Detail	Problem Solving
Conscientiousness	Responsibility
Initiative	Safety Orientation
Job Fit Motivation	Teamwork
Leadership Style	
Mechanical Reasoning	

Next, a training program design was compiled to determine which training could be handled in classrooms and how hands-on training, normally conducted on the plant floor, could be accomplished without access to the equipment. The training plan that resulted had several creative elements and required new hires to:

# GP Experience Summary

## **World Class Start-up** **AK Steel Selects GP** **Rockport, IN (continued)**

Attend classroom training to study steel-manufacturing basics (virtually none of the new hires had steel industry experience), learn electrical and mechanical fundamentals, develop team skills and become familiar with AK Steel's corporate values on safety and quality.

Visit the equipment vendors' facilities during simulation testing to use the new plant's computers, control panels and sensors to learn about systems integration

Observe operations at other AK Steel facilities to get a first-hand view of steel manufacturing processes and see AK Steel's safety and quality values in real-life application

Visit selected AK Steel competitor facilities to see varying technology-based manufacturing equipment and processes

Tour AK Steel sub-contractor facilities to learn how the steel they would soon be manufacturing is made into products

Tour customer facilities to see how AK Steel products are used and get a good understanding of end-customers' quality requirements.

With this unique mix of learning experiences, GP prepared the new technicians for jobs they could not actually see or do until the day they were expected to start real-life application of the learned skills.

### **The Results**

GP's creative training exceeded the expectations and broke new ground in steel manufacturing start-up efforts. Note these results:

The first two of six production lines at the new plant started up three months ahead of schedule

The third production coil of steel that came through the Rockport plant was "prime" (of sales quality) whereas normally it takes weeks to produce sales quality coils in a new facility

# GP Experience Summary

## **World Class Start-up** **AK Steel Selects GP** **Rockport, IN (continued)**

Before the first year of operation, a time when most companies would not have considered applying, QS-9000 registration had been awarded to shipping and receiving, the continuous cold mill and the continuous galvanizing line at the Rockport plant

GP has brought plant start-up to a new plane. When it was time to produce steel in the Rockport plant, the technicians were ready.

# GP Experience Summary

## **Field Technician Training Documents One Billion Dollar Refinery Expansion' Claymore, Inc./Irving Oil Limited New Brunswick, Canada**

GP teams with Claymore, Inc. of Canada to develop process training manuals and operating procedure manuals at Canada's largest oil refinery. Irving Oil Limited is investing in a one billion dollar expansion of its refinery in Saint John, New Brunswick. The upgrade project includes a residue fluidized catalytic cracker unit, a hydrogen sulfide recovery unit, a sour water stripper, sulfuric acid regeneration units, and a tail gas unit. The plant start-up is on an aggressive construction schedule with commissioning of the units occurring through September 2003. GP and Claymore were brought in to provide documentation of the new equipment and performance improvement processes for the benefit of the field technicians being trained to operate the upgrade equipment.

The development team includes four writers and a graphics specialist. The process training manuals describe the new equipment and systems, including process overviews, detailed equipment descriptions and consequence of deviation. The manual illustrations include equipment location drawings, process flow diagrams, and equipment schematic diagrams. The procedure manuals provide start-up, shutdown, normal, special, and emergency procedures for field technicians, as well as troubleshooting information.

# GP Experience Summary

## **Procedure Development and Operator Training Exxon Mobil New Delayed Coker Unit Baytown**

Exxon Mobil awarded the procedure development and operator training for their new Delayed Coker Unit in Baytown to General Physics Corporation. The DCU has a capacity of 40,000 b/d and was completed during the second half of 2001. General Physics developed startup, shutdown, normal, emergency, and special procedures, along with general and detailed process descriptions. GP also developed Post Technician and Console Operator training workbooks and training materials for the new DCU.

The Exxon Mobil refinery in Baytown has a capacity of 465,000 b/d and is one of the largest in the world. The refinery will also be building a new Sulfur Recover Unit and making a number of modifications to the other units to run heavy Maya crude from Mexico.

# GP Experience Summary

## **Technical Documentation and Original Equipment Manufacture Manual Production Verson Press**

Verson Press, a division of Allied Products Corporation, has awarded the development, procedure, and production of their Original Equipment Manufacturers Press Manuals to GP. GP has researched the needs of Verson's customers and has designed a new press manual presentation that includes technical data, original design drawings, operation procedures, troubleshooting procedures, safety training, and spare parts listing.

Verson has also awarded GP with a contract to supply two animations of a working Verson Press. One animation will depict the benefits of an Electronic Transfer Feed System and will also depict the operation of the feed system during a pressing cycle. The second animation will depict the Verson press performing a fully automatic die change sequence.

Verson is a world-class supplier of large Transfer Presses. Verson is ISO 9002 registered.

# GP Experience Summary

## **Plant Expansion Program Development Lafarge (formerly Blue Circle) Roberta, AL Facility**

Lafarge contracted General Physics to develop a training program that would address the needs of the plant for the expansion project. The expansion was to incorporate a production process and equipment that were new to the Roberta operators and maintenance workers. GP first conducted a job-task analysis to determine the current and future tasks of production and maintenance personnel at the Roberta plant. The analysis revealed:

- . No training was necessary for basic production and maintenance skills
- . Familiarization with the new process and equipment would be required
- . Training on field operation and maintenance of the new equipment would be required
- . Training on control room operations would be required

Based on the analysis, a course outline was developed to address specific areas of training necessary for Roberta plant personnel. A training program was designed and implemented that included classroom and field training. Training materials included process and equipment overviews, operating procedures for production personnel, and maintenance schedules and procedures for maintenance personnel. The process overview explained the new production process in which Lafarge employees would be working when the expansion project was complete. Equipment overviews explained the design and operating principles of the new equipment. The procedures, which were taught in classrooms and in the field, explained to operators and maintenance personnel how to run and maintain the new equipment.

Classroom instruction was delivered through PowerPoint presentations, flip charts, engineering drawings, vendor manuals, and the GP-developed training materials. Trainees learned the process and equipment before they went to the field. Field instruction included on-site walk-throughs in which trainees observed the equipment as they progressed through the production process tracing a process flow diagram. For field procedures, trainees walked through the step-by-step procedures at the equipment locations.

Vendor training on specific electrical and instrumentation equipment and simulator training for control room operators was incorporated into the training program. Vendor-arranged courses included hands-on training with computers, software, and electrical equipment provided by the vendor. Simulator training included

# GP Experience Summary

## **Plant Expansion Program Development Lafarge (formerly Blue Circle) Roberta, AL Facility (continued)**

normal operating procedures and responding to scenarios the operators would face in real life situations. The simulator was designed and programmed by a vendor, who also provided the basic simulator training documents. General Physics developed control room operating procedures that trainees used when they were training on the simulator. The procedures covered the actual control scheme for the new equipment and process.

General Physics also developed written and simulator performance evaluations for control room operators and helped Lafarge develop written performance evaluations for maintenance personnel.

Upon completion of the training program, Lafarge production and maintenance personnel were knowledgeable of and comfortable with the new process and equipment. As a result of the training, the Lafarge Roberta plant had a quick and successful start-up and a shorter transition period to steady-state operations than had been expected.