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## Project Profile: New Lubricating Oil Blending Plant

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### COMPANY

Apollo America Corp.  
Subsidiary of Idemitsu Kosan Co., Ltd.  
Tokyo, Japan

### FACILITY

Oil Blending Plant for Automotive,  
Maintenance and Metal Working Oils

### LOCATION

Clark Maritime Centre  
Jeffersonville, IN

### OBJECTIVES

- Fully Automated Process Control System
- Integral Order Entry/Tracking System & Process Control System
- Automated Recipe Management
- Automated Scheduling
- Automated Production Reporting
- Control of Small Additions of Additives

### SERVICES PROVIDED

- Process Engineering
- Process Electrical & Instrumentation Design
- Software Development
- Construction Supervision
- Precommissioning & Commissioning
- Plant Startup
- Training

### SYSTEMS PROVIDED

- Johnson/Yokogawa Micro XL
- L&J Technologies Tank Level System
- Maple Systems Data Panels
- Drum Transfer System
- Allen-Bradley Bar Code
- Metering & Control Valves
- General Process Instrumentation & Control Devices
- Process Control Panels

### SOFTWARE

- Micro XL Control Software
- Micro XL Enhanced Recipe Management System
- Micro XL Basic
- Micro XL Report Generator
- Micro XL Ethernet Communications Software
- Micro XL Serial Communications Software
- Maple Systems Software
- Allen-Bradley PLC 2, PLC 5, SLC 500

### PROJECT DESCRIPTION

The facility is a highly automated blending plant that was built to supply automotive lubricants and production lubricants for the automotive industries in our area. The facility was constructed using the design/build approach where we acted as a subcontractor to Gray Construction Company of Lexington, KY. Our responsibilities consisted of process electrical and instrumentation design, process design support and development of P&I diagram. We also provided the process control system, all process control hardware, field instrumentation and software. We participated in all phases of the project from design through construction and plant startup.

The process includes a rail and truck tank-car unloading facility and a tank farm consisting of 35 storage tanks for base oils, additives, and finished products. The blending operation is comprised of both batch blending tanks for small quantity batches, and a continuous inline blender for larger quantities. The packaging and shipping facility consists of quart, pail and 55 gallon drum lines and a truck loading facility for bulk shipments.

The process control system is based on the Johnson/Yokogawa Micro XL distributed control system and had approximately 1600 I/O. The software system utilized JYC's standard control software as well as their enhanced recipe management software. In addition, a number of control programs were written by Pfeiffer Engineering in JYC's basic language. As an added feature, we provided eight (8) local data entry panels which are placed around the plant to give the floor operators access to process data. Also, bar code readers and label printers were used for raw material control. This installation was one of the largest of its type utilizing the Micro XL control system and was the first system integrated in the U.S. to implement JYC's Enhanced Recipe Management system.

The process utilizes batch mixing tanks with a large manifold system and an inline mixer for continuous blending. The control system employs conventional batch recipe control for control of the batch blenders and a sophisticated system of recipe control, digital blending techniques and batch control to form a large ratio control system for the inline mixer. As an added feature, a special pacing strategy is employed by the ratio control system to throttle back flows when process upsets occur.

The Micro-XL System was configured to provide overall control of the plant from the incoming raw materials to the control of packaging and bulk loading systems. In addition to process control, the Micro-XL provides inventory control and reporting of all bulk quantities in conjunction with a Storage Tank Level System. The Micro-XL communicates with the plant's Order Entry/Management Information System to obtain production schedules, recipe data and to upload batch results and inventory data. The Micro-XL communicates to the various production locations via data display and message centers to keep all personnel informed as to production steps and inventory amounts.