

DAKOTA GASIFICATION

Successfully Converts to LABVANTAGE Laboratory,
Productivity Increases 30% without Additional Staffing

Company Background



Basin Electric was formed in 1961 to provide supplemental electricity to the farms and rural areas in the upper Midwest and West. As a consumer-owned regional transmission and generation cooperative, Basin operates more than 3,300 megawatts of capacity. Basin Electric has power plants located in North Dakota, South Dakota and Wyoming. Through its 118-member cooperatives,

Basin Electric supplies electricity to more than 1.5 million consumers in an eight-state region. Basin purchased Great Plain Synfuels Plant from the Department of Energy in 1988. The plant was a 2.1 billion dollar project put into operation by a number of energy providers in late 1983. Dakota Gasification Company (DGC) continues the effort towards energy independence and the development of new and innovative uses of lignite coal. It is one-of-a kind in the nation. Freedom Mine supplies lignite to the facility. Freedom Mine is the largest surface mine in North Dakota and is one of the ten largest coal producing mines in the United States. The Synfuels plant produces about 160 million standard cubic feet of natural gas daily (enough to heat 300,000 homes). Byproducts include:

- Anhydrous Ammonia @ 1,200 tons/day
- Ammonium Sulfate @ 450 tons/day
- Phenol @ 45 tons/day
- Cresylic Acid @ 45 tons/day
- Kryptonxenon @ 9,500 liters/day
- Carbon Dioxide @ 95 million cubic feet/day
- Naphtha @ 23,000 gallons/day
- Liquid Nitrogen

This functionality has been a wonderful addition that has greatly enhanced productivity and efficiency.

The plant employs 750 people, and the laboratory itself has 33 full time employees. Functions of the laboratory include quality assurance of process control, product quality, environmental monitoring, industrial hygiene monitoring, quality assurance of coal for mining operation, process research, lubrication oil quality, byproduct development/pilot plant support and contract laboratory for nearby energy plants. The laboratory analyzes solids, liquids and gases. The instrumentation in the laboratory includes 12 GC's, 2 GCMS's, 5 HPLC's, 2 IC's, CE, 4 Auto-titrators, ICP, GFAA, AA, Mercury Analyzer, XRF, distillation and wet chemistry equipment and coal equipment.

Key Challenges

DGC's biggest challenge was finding a reasonably priced LIMS that would provide data instantaneously to customers on a 24/7/365 basis.

System Sought

DGC had strict specification requirements. The system had to be easy-to-use, easy-to-configure, easy-to-maintain, and dependable. The system had to have a way to automatically log in 150 daily routine

samples. The scheduler portion had to be able to log in the same sample point at different times with different parameter lists on Customer Case Studies Describing Utilization and Application of LabVantage Software Solutions different days of the week and on specific days of the month. The system had to have a way to import data from various instruments in the laboratory. The system had to have limit checking to hold “out-of-specification” results for approval and release while releasing other analytes within specified limits immediately.

System Selected

DGC decided on LABVANTAGE because LABVANTAGE had all of the elements required. DGC liked the ability to tailor the system to fit their needs.

System Delivered

In October 2000, DGC staff traveled to New Jersey to configure the system. Items configured during this trip included the sample scheduler and several custom actions dealing with trend checking, approval, release and deletion of records. DGC continued to customize specific reports and then populated various tables. LabVantage visited DGC to work on building custom actions for importing data from instrumentation. These actions directly import results from many instrumentation in the laboratory to LABVANTAGE tables. This functionality has been a wonderful addition that has greatly enhanced productivity and efficiency. LabVantage also built an action that would delete data from samples that were not analyzed for various reasons while keeping a record of the sample for historical purposes.

DGC staff built archive tables in the Oracle database that could be accessed by the plant staff. Data from 1987 to 2000 were stored in the archive tables. DGC went live with LABVANTAGE on May 1, 2001. Training the staff was easy. It took less than 10 minutes to train each person on how to log in samples, print out bench work lists and enter sample data.

Unforeseen Benefits

Increased efficiency. 90% of data entered into LABVANTAGE is done via import actions. This has made the efficiency of the laboratory increase exponentially. The workload in the laboratory has increased by one-third over last year. The laboratory has been able to adjust to this increase without additional staff or overtime because of the efficiency of the LABVANTAGE system. Increased dependability. The dependability of the system has been amazing. The system has not been down for an extended period of time. Increased interface with other products. Customers have the ability to take data from the system and merge it with other systems. Sample information from LABVANTAGE is combined with information from Aspen Process Explorer - software that pulls information from process analyzers. The information allows production staff to review overall process data and make process decisions based on the information. Maintenance of LABVANTAGE has been minimal after our initial setup.

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