

Improving overall plant efficiency must always be a goal in order to remain competitive in today's economy. Reducing unnecessary downtime and increasing product flow can lower the overall cost of production. As a leader in plant efficiency-through-automation, **ESP** has developed a system to allow plant management to monitor and improve the efficiency of their primary haul trucks.

Our latest addition to our automation suite of products is

HAULTrac, a low-cost, low maintenance system that monitors the efficiency and production performance of the primary plant haul trucks. This product complements our other aggregate plant products of **OPENPlant Control** and **LOADTrac** to provide a suite of products enabling tremendous efficiency gains from the primary pit to the loadout of customer trucks and railcars.

Our innovative solution utilizes many of the same technological features and products as the other productivity software solutions in our suite. Automatic detection and logging of haul trucks is paramount to a simple yet accurate tracking system that requires very little operator involvement. We made sure that the information presented to supervisors and managers will allow them to view the appropriate

metrics and make critical operating decisions based on the information.

As always, in order to provide our packaged solution at a competitive price and offer more features, we have developed a toolkit of functions based on standardized software and hardware components.

Two parts make up the core of the **HAULTrac** system: The first is an RFID (Radio Frequency ID) system that allows us to capture when a truck dumps

a load into the primary crusher. The second is a PC based Human Machine Interface (HMI) that is used to monitor cycle times, dump counts and tons produced.

The application has been developed to fit nearly any primary plant configuration, eliminating the need for any costly custom programming. This has allowed ESP to offer this system at a fraction of the cost of other similar products. Since the system is consistent across all installations, the end-user can be assured of trouble-free, consistent operation.

We deliver the system fully assembled and configured and ready for installation at the plant. Detailed installation documentation will allow plant personnel to install the system in a very short amount of time. Of course, an ESP engineer will always be available to answer questions or assist in system setup and training.



HAULTrac®

Equipment/Hardware: The RFID hardware and sensors chosen for HAULTrac are used in numerous harsh environment applications. Thousands of readers and millions of tags are in use throughout the world in similar outdoor environments. Each component of the HAULTrac system have been chosen based on ruggedness and ease of operation, reducing maintenance efforts and increasing system life.



HMI Overview Screen: The main screen on the HMI system shows the current shift's haul truck information, including number of dumps, nominal tonnage, minimum/maximum and average cycle times.

User-Friendly HMI: Operators with few or no computer skills can be trained to use the HMI effectively in less than 30 minutes. We use simple and intuitive controls and minimize any operator actions to the bare minimum.

Reports: Our reporting module provides production data, cycle time summaries per haul truck and reason codes for excess cycle times. The information is viewable with a standard web browser from any PC on the control system network. No client access licenses are required. Reporting can be set up over company intranets to provide a consolidated report covering multiple sites.

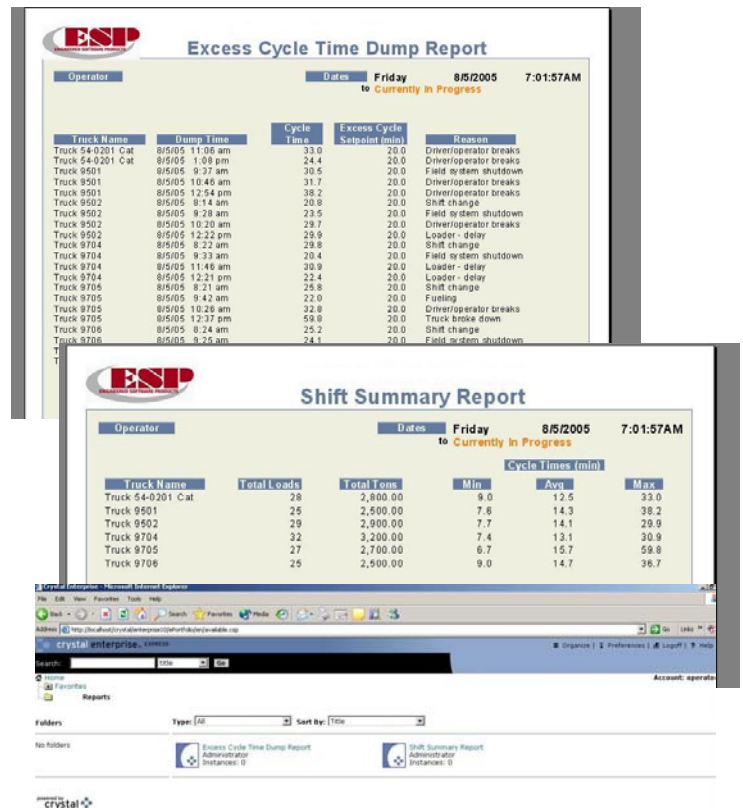
Security: Built-in security provides password levels that enable changes to control parameters such as nominal cycle times and truck configurations.

Remote Engineering Support (RES): ESP can provide programming and troubleshooting support over a variety of media. Telephone connection provides a low-cost and secure connection while faster connections such as VPNs can allow real-time access to the system remotely.

Installation: The system is ready for installation out of the box and requires only minimal on-site mounting and wiring for most plants.

With HAULTrac you can achieve:

- ✓ Accurate automatic measurement of Cycle Times
- ✓ Accountability for drivers
- ✓ Identification of lost production causes
- ✓ Improved measurement of Primary Production
- ✓ Tools to help you better utilize existing equipment and resources
- ✓ **MORE EFFICIENT OPERATION!**



The image displays two screenshots of the ESP software interface. The top screenshot is titled "Excess Cycle Time Dump Report" and shows a table of data for Friday, 8/5/2005, from 7:01:57AM to the current time. The table lists truck names, dump times, cycle times, excess cycle times, and reasons for excess times. The bottom screenshot is titled "Shift Summary Report" and shows a summary table for the same shift, including total loads, total tons, and cycle time statistics (min, avg, max) for each truck.

Truck Name	Dump Time	Cycle Time	Excess Cycle Setpoint (min)	Reason
Truck 54-0201 Cat	8/5/05 9:06 am	33.0	20.0	Driver/operator breaks
Truck 54-0201 Cat	8/5/05 1:08 pm	24.4	20.0	Driver/operator breaks
Truck 9501	8/5/05 9:37 am	30.5	20.0	Field system shutdown
Truck 9501	8/5/05 10:46 am	31.7	20.0	Driver/operator breaks
Truck 9501	8/5/05 12:54 pm	38.2	20.0	Driver/operator breaks
Truck 9502	8/5/05 8:14 am	20.8	20.0	Shift change
Truck 9502	8/5/05 9:28 am	23.5	20.0	Field system shutdown
Truck 9502	8/5/05 10:20 am	29.7	20.0	Driver/operator breaks
Truck 9502	8/5/05 12:22 pm	29.9	20.0	Loader - delay
Truck 9704	8/5/05 9:22 am	29.8	20.0	Shift change
Truck 9704	8/5/05 9:33 am	20.4	20.0	Field system shutdown
Truck 9704	8/5/05 11:46 am	30.9	20.0	Loader - delay
Truck 9704	8/5/05 12:21 pm	22.4	20.0	Loader - delay
Truck 9705	8/5/05 8:21 am	25.8	20.0	Shift change
Truck 9705	8/5/05 9:42 am	22.0	20.0	Fueling
Truck 9705	8/5/05 10:26 am	32.8	20.0	Driver/operator breaks
Truck 9705	8/5/05 12:37 pm	59.0	20.0	Truck broke down
Truck 9706	8/5/05 8:24 am	25.2	20.0	Shift change
Truck 9706	8/5/05 9:35 am	24.1	20.0	Field system shutdown

Truck Name	Total Loads	Total Tons	Min	Avg	Max
Truck 54-0201 Cat	28	2,800.00	9.0	12.5	33.0
Truck 9501	26	2,500.00	7.8	14.3	38.2
Truck 9502	29	2,900.00	7.7	14.1	29.9
Truck 9704	32	3,200.00	7.4	13.1	30.9
Truck 9705	27	2,700.00	6.7	15.7	59.8
Truck 9706	25	2,500.00	9.0	14.7	38.7

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