

3D TRASAR™ technology used as a diagnostic and control tool to reduce water consumption at major tire manufacturer in Brazil



BACKGROUND

This is a world leader company operating in the tire and rubber segments with a large manufacturing operation in Brazil. In addition to tires for use in a wide variety of applications, it also manufactures a broad range of diversified products, which include industrial rubber, chemical products, and sporting goods. Its products are sold in over 150 nations and territories around the world.

The company makes a very high level and public commitment to the sustainability of its global operations and regularly publishes information on its sustainability goals and their achievement. The company's environmental mission statement mentions the continuous work to reduce the environmental impact of operations through various measures such as the installation of energy efficient, co-generation systems and environmental building design and utilization at their plants.

Based on this key business driver, the Nalco Water team proposed a diagnostic approach in order to evaluate if there was any opportunity for reducing water consumption at the tire plant.

SITUATION

The customer's cooling system chosen for this project has a unique complexity, having a cooling tower that cools the bladders system where the recirculation water has direct contact with the bladder rubber, contaminating the recirculation water with oil (coming from tire components themselves and from machine lubricants). Besides this, the Holding Time Index is low due to low cycles of concentration and leaks (uncontrolled blow down). The makeup water is a mixture of recycled waste, water effluent, and city water. The system also has condensate contribution from contact heater (see diagram on next page). Due to these circumstances, this system is heavily bio fouled and determining the flow dynamics is very challenging.

ANNUAL SAVINGS



WATER

Reduced water consumption by

6,408 m³
(41%)
annually

VALUE DELIVERED

Reduced
water costs by over

\$4,870
ANNUALLY

SOLUTION

In order to fully understand its flow dynamics, Nalco Water implemented the 3D TRASAR Technology for cooling water.

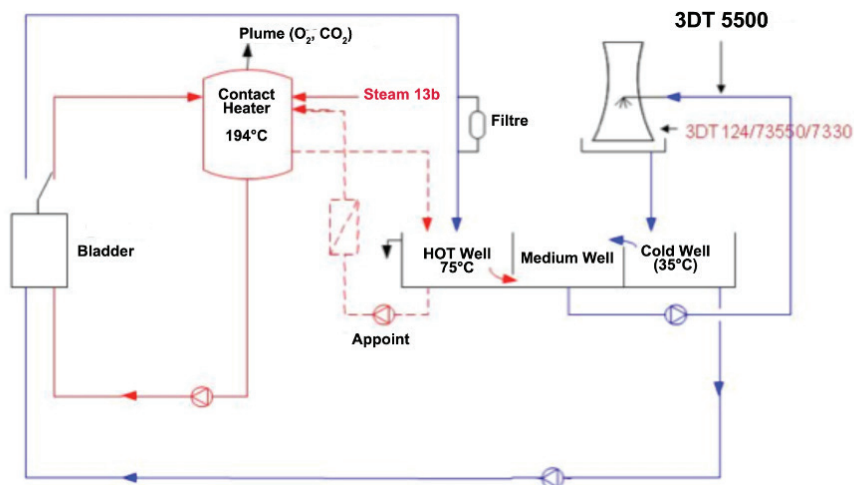
The 3D TRASAR program for cooling water delivers on demand control and optimization of cooling water chemistry and microbiology, continuously protecting the system from corrosion, scale formation, and microbial infection. 3D TRASAR technology is used by thousands of corporations around the world to:

- Secure improvements in their environmental and economic performance
- Optimize cooling system efficiency
- Help them to meet their sustainability goals, specifically in the areas of water and energy use reduction

3D TRASAR control systems take account of the inherent variability in system water conditions, maintaining protection from corrosion and scale by prediction of problems, and intervening before they occur. The program controls system chemistry, dosing on-demand, and minimizing the amount of materials added to the system, minimizing costs without prejudicing system integrity.

This project was divided in two phases:

- 1) Implementation of a 3D TRASAR technology to understand the system's mass balance, identify the leaks and start-up the 3D TRASAR controller to manage the cooling water program and keeping the cycles of concentration at the right levels.
- 2) Once the first phase was implemented, a new 3D TRASAR program was performed aiming to identify the new mass balance



RESULTS

The first 3D TRASAR technology approach presented the following results:

- Total Leaks: 15.480 m³/year
- Holding Time Index: 5.3 hours
- System Volume: 86 m³
- Makeup water cost: US\$ 0,76/m³
- Makeup water annual cost due leaks: US\$ 11.746,00

After this first diagnostic, a task force composed of the Nalco Water team and key people at the customer site was created in order to evaluate options to reduce the water consumption. Nalco Water implemented the cycles of concentration control installing one 3D TRASAR controller and, by using a Nalco Water handheld fluorometer, the team was able to find out the leaks. Once the leaks were discovered, the customer maintenance department requested to fix them. After the first phase was concluded, a second 3D TRASAR diagnostic test was conducted, showing leak reduction.

Total leaks (before task force actions): 15.480 m³/year

Total leaks after 3D TRASAR technology implementation and task force actions: 9.072 m³/year

Water savings: 15.480 m³ - 9.072 m³ = 6.408 m³/year

CONCLUSION

The 3D TRASAR technology used as a diagnostic and control tool was able to reduce the water consumption for this unique cooling water system. It is important to note that not all leaks were possible to control due to the system complexity, but as a clear recognition from the value of this approach, the customer has asked Nalco Water to perform more 3D TRASAR services at six other cooling towers.

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