



SOFTWARE - SYNERGI™ PIPELINE

WORLD'S LARGEST SLURRY PIPELINES

Customer story - Samarco

The Brazilian iron ore mining company Samarco Mineracao has built the world's largest slurry pipelines, with the three lines covering over 400 km from the iron ore mines to the pellet production plant. In order to take on both general pipeline integrity management and specific slurry-related challenges, Samarco uses DNV GL's Synergi Pipeline.

Samarco pipeline specialist Ricardo Bruno Nébias Andrade has been with the company for 12 years, and initiated the systematic approach to pipeline integrity management. By 2005, when Samarco was starting to use in-line inspection tools they were relying on an Excel sheet to compile all the data for the 400 km long pipelines. The mine is at Germano, 30 km from the city of Mariana in the state of Minas Gerais in southern Brazil.

"We were multiplying probability of failure based on the inspection of the smart pigs with consequence of failure, and the result was the risk. But there was no geographical information in the system. The amount of data was immense, and Excel could not handle it. There was a limit of 65,536 lines in Excel, and we had more," says Mr Nébias.

"We realized we were not going to the root of the problems. We were only tracking where the defects were and determining how to deal with them. There was a backlog, so it was a matter of prioritizing them," he says. He knew a more proactive approach was necessary. But it was an extremely large job.

Subsequently, in 2008, after another smart pig inspection, the amount of data doubled, and the Samarco integrity management team started looking for dedicated pipeline integrity management software. After writing the scope, Samarco invited five companies to make a bid.

In the scope, the items were rated from 0 to 10. Three Samarco engineers rated the bids independently, without communicating with each other. "DNV GL was number one on the technical aspects of the bid with all three of our engineers," says Mr Nébias, whose background is in mechanical engineering.

The Samarco integrity management team started implementing Synergi Pipeline in 2010. Today Mr Nébias works with an integrity team of eight people. The integrity team is under the integrity department manager. The pipeline manager is head of three departments: operations, maintenance and integrity.

The challenges of slurry pipelines are unique. Slurry is a combination of ore and water, and the heavy iron particles cause

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Ricardo Bruno Nébias Andrade, Pipeline Specialist, Samarco Mineracao

substantial erosion, focused on the lower half of the pipe, that defines the lifespan of the asset. In addition, there are corrosion defects, and complex interplay between erosion and corrosion.

DNV GL has invested resources in tackling the challenges of slurry pipelines specifically according to Samarco’s needs, and has created a new Synergi Pipeline Erosion Tool.

“DNV GL solved this for us, and it’s now the only such tool on the market,” says Mr Nébias.

“DNV GL brings my work to another level. I have an overview of all threats and how they should be treated. A lot of different things are happening at the same time. This produces different types of data. It is only feasible to work with all of the data when you have specific software. I also realize that DNV GL is enhancing the solution by bringing it into Synergi and adding new tools and new features,” he says.

Important improvements, he says, are the GIS and SAP interfaces. “This is important to Samarco and also important to all pipeline operators.” Future plans include external audits, and Synergi Pipeline is designed to be easily used for external audits, with a transparent frame.

“I really enjoy working with DNV GL - Software people,” says Mr Nébias. “They are very experienced. When I’m in meetings with the DNV GL team I realize the high level of knowledge they bring to the discussion. Their experience of all kinds of pipelines in the world is included in the software. They also accept the idea of specific threats to slurry, which involve a complex and unusual scope. Every time I have a problem the whole team solves it really fast.”

Samarco is totally supporting the integrity team, reflecting the fact that the pipelines are an extremely important asset.

“When you start working on this, it seems that risk is increasing. But previously it was just hidden. Our goal is to always make the system better and better,” he says.



SAMARCO MINERACAO IN BRIEF

Founded in 1977, Samarco is a privately held Brazilian mining company whose main product is iron ore pellets, sold in 19 countries on all continents. Annual production capacity is 22.25 million tons, making them the world’s second largest exporter on the seaborne iron ore pellet market. Two concentrators are installed in the Germano unit, located in the cities of Mariana and Ouro Preto, in Minas Gerais, which beneficiate the ore and increase its iron content.

In addition there are three pellet plants that transform the ore into pellets at the Ubu unit, in Anchieta, in Espírito Santo. The two industrial units are connected by two pipelines, the largest of their kind, measuring almost 400 km. Samarco is a pioneer in this type of transportation.

PROFILE

- Customer name: Samarco Mineracao
- Web address: www.samarco.com
- Market: Iron ore mining
- Employees: 2,517
- Solution/product: Synergi Pipeline

BRIEF ACCOUNT

Why we chose DNV GL - Software:

- DNV GL delivered the best technical proposal
- adherence to the scope
- DNV GL’s extensive experience on pipelines
- current global participation in pipeline markets

This is what we gained:

- better way to calculate the lifetime of pipelines
- better risk evaluation
- increased transparency, important to Samarco and external auditors
- constant improvement of systems
- full control naming elements