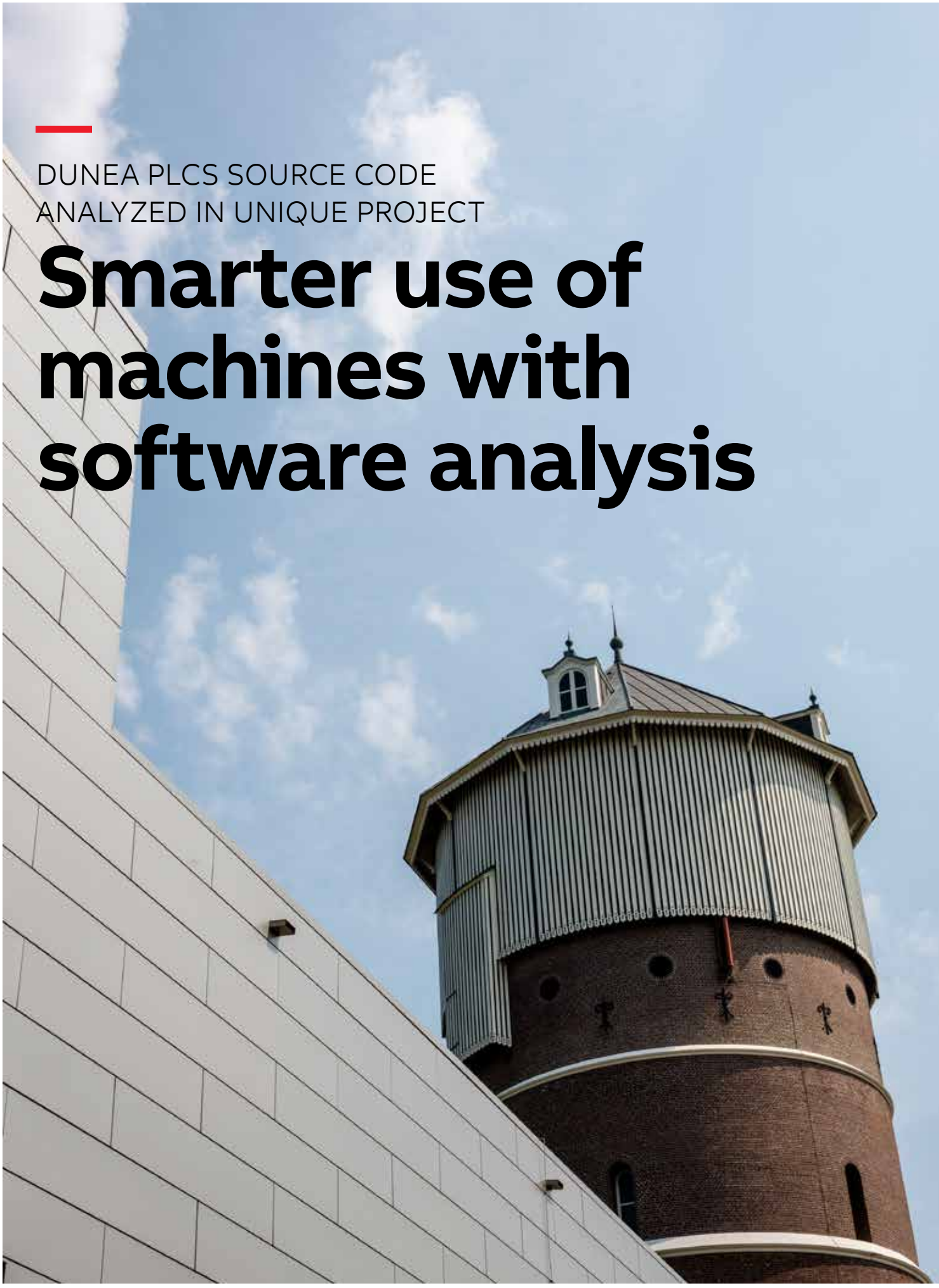
DUNEA PLCS SOURCE CODE
ANALYZED IN UNIQUE PROJECT

Smarter use of machines with software analysis



Drinking water company Dunea produces and supplies drinking water to 1.3 million customers in the western part of South Holland province.
The dunes between Monster and Katwijk are vital for the production of drinking water and as recreational area for one million visitors each year. Dunea manages these dunes with utmost care and is one of the initiators of the Holland Dunes National Park. Its partner SIG recently analyzed the software that Dunea uses to control ABB drives. This analysis resulted in new insights in the area of sustainability, a theme that is high on the agenda of both Dunea and ABB.

From left to right: Thijs Aanhane, Tibor Lapikas, Alex Houtman and Cuno van den Hondel.

A project in which control rooms in Katwijk and Scheveningen were merged seemed to be the ideal opportunity to further examine the control software of PLCs. This approach, which is quite new within this industry, yielded a lot of useful insights.

LOOKING UNDER THE HOOD

"Dunea has been working on a major automation project in recent years," says Thijs Aanhane, IT and OT Domain Manager at Dunea. "Multiple programmers adjusted our entire process automation over the past ten years. We were convinced that our software and hardware worked perfectly, but wanted to know what could be done even better. For us, the emphasis was always on the functional operation of software, but we never really 'looked under the hood' before. You acquire more and more knowledge of the system through the years, but you also want a better understanding of how everything works. We looked for opportunities to implement improvements within the framework of the ISO/IEC 25010 standard and also wanted to know whether there was a connection between the controller load, the CPU load and the size of programs. When another major automation project was about to take place, we thought it was a good time to analyze this with ABB."
"The standard software library has been copied a few times and was adjusted every time," continues Alex Houtman, who is responsible for process automation at Dunea. "We thought that there might be a number of duplications in the software, but the outcome was still a surprise! Half of it had been duplicated."

THE SOLUTION

SIG, a company dedicated to analyzing and improving critical business software, analyzed the software quality of the PLC code of the Monster Pumping Station. This source code consists of the

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TIBOR LAPIKAS,
SENIOR CONSULTANT AT SIG

code in 10 ABB-PLCs that jointly control the entire station. "We are not experts in the field of water purification, but the knowledge that we gained by working with other industrial applications could also be used optimally here," explains Tibor Lapikas, Senior Consultant at SIG. "We learned a lot about how this type of software is organized and the specific requirements that it needs to meet. We think ABB made a smart decision by taking this step and making a project like this possible. Our investigation revealed that while the software of ABB meets market standards, the opportunity also exists to further improve its maintainability, which will ultimately make it more sustainable. We also provided advice on the standardization of operating software and the resulting benefits."
But SIG doesn't merely issue a one-time stamp of approval and call the process complete. Tibor: "Consideration must always be given to how it can be done in an even smarter and better way. It is important to think about the life cycle and not about project deadlines. How do you tackle matters at the start of a project in a smart, efficient way, so that later adjustments can be made in an equally smart and efficient way? We now have a kind of baseline and can periodically reassess the software. Discussions between customers and suppliers are based on facts, and not on assumptions or suspicions."

CONTINUOUS IMPROVEMENT

"We found it particularly interesting to have SIG qualify how reliable our software is," says Cuno van den Hondel, IAPG Sales and Marketing Manager at ABB. "Naturally, this is a sensitive matter for both customers and suppliers. However, we did not want to assess our own software and are happy with the independent view from SIG. We wanted to determine what could be done better. Naturally, we are happy to receive a quality label."

THE FUTURE

Alex: "The lessons that we learn here enable us to make improvements with every upgrade. We now know exactly what to focus on in the future. You also start to ask other questions: is it more convenient to write a piece of code 20 times for each PLC? Perhaps it might be better to write a relative program and link a number of parameter tables to it? The latter is less transparent, but ultimately turns out to be smarter and offers more room for innovation.
We expect ABB to really do something with these insights, but we have the utmost confidence in that."

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Recent analyses provided Dunea with new insights regarding sustainability.

LONG-TERM RELATIONSHIPS

"Of course, you can always buy the largest machines to ensure that you have enough capacity," explains Thijs. "But that is not exactly cost-conscious or sustainable. Thorough research is essential if you want to optimize everything. You also need to ensure that your test protocol is in order before you start building. Based on such research, you can standardize processes and avoid overqualification, and make optimal choices in the area of hardware. We can now show our management that we are making the right decisions." Tibor: "Hardware is sometimes replaced because the associated software is obsolete. If the software is easy to maintain, however, you can add new functionality and keep working longer with the same machines. If you can free memory space by removing duplicated code, a company may not have to purchase a new controller."

"You might think that a situation in which customers regularly have to purchase new hardware is considered a good thing for a company like ABB, but we are mainly concerned with building long-term relationships," concludes Cuno. "We do not want customers to make huge investments that offer little added value. A software analysis can make an important contribution to this. We are currently investigating how we can also offer this service to other customers."

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ALEX HUISMAN, DUNEA PROCESS AUTOMATION