Dear reader,

In this edition we would like to inform you about new functionalities of the P14 family. Since our last newsletter we have optimized our product range, exchanging a number of devices with a more highly developed product version.

After we announced our new Universal Input Module 81EU50R1210 in the last P14 news we are proud to introduce our new remote bus coupling module 88TK60R1210 within the bulletin at hand. Therewith we continue our streamlining strategy which will result in a minimum multifunctional devices sufficient to maintain the complete power plant.

The remote bus coupling module 88TK60R1210 is used to couple the Procontrol station to the Procontrol remote bus which uses the High-availability Seamless Redundancy (HSR) protocol. HSR protocol is a standard Ethernet (IEEE 802.3) redundancy protocol. The module is equipped with up to date components and fully replaces the predecessor modules.

We furthermore want to inform you about the successful upgrade of the P14 control system of the power plant Heilbronn, Germany, as well as the Power Generation Care contract – an evolved, cooperative concept focused on customer requirements. In this way, the ABB solution enables you as the customer to benefit from savings effects without reduction in performance, while protecting your previous and future investments.

Also I would like to announce Dominik Eifel as the new P14 Evolution Manager. He will take over the position after my retirement at the end of this year.

Your local representative and I welcome any questions or comments you may have reading our newsletter.

I wish you a pleasant read and look forward to your feedback.

With kind regards,
Günter Herz
Procontrol P14 Evolution Manager
ABB Power Generation
ABB: reliable partner for system migration and service at the Heilbronn thermal power station

Operations started at Unit 7 in Heilbronn over 35 years ago. At the time, it was one of the largest conventional power station units of the energy group EnBW. Since then, and particularly in the last three years, ABB has been a reliable partner for the power station, undertaking the progressive migration of control technology for turbine and boiler protection in the station’s three active units – Units 5, 6 and 7.

Constructed in the 1950s, Units 1 and 2 of the Heilbronn power station were decommissioned in 1988, followed many years ago by the decommissioning of Unit 3 and 4, which had an output of 200 megawatts (MW) each.

Now, a walk through the control centre for Units 1 and 2 is like taking a trip through the history of power station technology. The former control rooms are like a museum. This space has now become the temporary office for the ABB service engineers and project management team during the horizontal migration period.

In comparison, the control centre for Units 5 and 6 is ten years younger and recognizably more modern, and Unit 7, which generates over 800 MW, also has a more contemporary, digitalized control centre.

The ABB project manager leads a team of ten employees who have whipped the control technology of the identically constructed Units 5 and 6 into shape in only five weeks: boiler protection, turbine protection, turbine control. Both of these units are operated as back-up power stations – only used if the wind is too weak, if there is insufficient sunshine or when fluctuations in the electricity network threaten to be excessive for other reasons. Both units are considered ‘system-relevant’ and are routinely started up on a monthly basis to ensure their availability.

Time is money
The 30-year-old control system of Units 5 and 6 was outdated. The ABB service team’s task was to refit it to the tried and tested, modular construction, migration-based ABB control system, Procontrol P14.

The entire migration including the commissioning has been completed within only three months. Today, considerably shorter timeframes are being expected by the plant operators as part of their regular plant shutdowns. This was the biggest challenge. In order to reduce the downtimes of the plant, and in the interest of the customer, the ABB service team worked over many weekends and bank holidays.

The ABB service concept for power generation customers is not only based on extensive process and application know-how, but predominantly also on the longstanding customer relationships and continuity in customer advice and care by the plant managers.

In the middle of 2015, the ageing existing systems of Units 5 and 6 were migrated to the pre-tested control technology P14, which, it is envisaged, will be in service until 2030. It has been almost seamless since then, with the gradual modernization of power station control technology in Unit 7. The unit was completely equipped with the electrical system by ABB at the start of the 1980s: turbines, generators, Procontrol P14 control technology and everything related to this system. However, over the years, the measurement accuracy has gradually decreased. That is why EnBW, with ABB, has gradually been replacing all switching cabinets since 2012 – ABB has refitted approximately one-fifth of the cabinets in this time. With the harmonization and modernization of Units 5, 6 and 7, EnBW is simultaneously obtaining a joint operating and observation system for all three units. At the start of this year, the draught regulation for both units was also migrated.

Like the back of their hand
This was a fundamental criterion for the energy group in finally awarding the contract. ABB was not necessarily the ‘preferred supplier’, despite the long-standing customer relationship.

The phased control technology modernization works are ongoing, and the respective inspection times of the turbines set the pace. In order to continue to be on the safe side in future, EnBW has extended its existing service contract across all three units.

“But we have already had a very good experience with ABB over the years,” explains Walter Heidrich, joint control technology manager at the Heilbronn power station. “ABB colleagues have known our power station like the back of their hand for over 30 years. In all this time, few disruptions have occurred – and this is why we trust ABB. Our ultimate objective is for the plant to run reliably.”
Module characteristics
- The High-availability Seamless Redundancy (HSR) protocol is a standard Ethernet (IEEE 802.3) redundancy protocol.
- HSR provides network redundancy by packet duplication over two independent networks that operate in parallel in a ring network topology.
- HSR provides a cost effective redundancy solution fulfilling real-time requirements with no single point of failure and zero switch over time.
- HSR fully replaces the two predecessor remote bus transport protocols of the Master Station and FDDI systems.
- The remote bus architecture is a redundant ring network topology with fiber optic connectors and cabling identical to the one used in the predecessor FDDI systems.
- The existing P14 remote bus application protocol is kept unchanged.

Technical Data
- Transmission protocol: HSR acc. to IEC 62439-3
- Transmission rate: 100 Mbit/sec
- Maximum distance between 2 stations: 2 km
- Maximum number of stations in HSR ring: 249
- Maximum extension of HSR ring: 100 km
- Network cable type: Multimode fiber optic
- Network connector type: Duplex SC

New module available in the Procontrol P14 product family
Remote Bus Communication Module 88TK60R1210

Industrial Ethernet
Remote Bus Communication Module 88TK60R1210

According to the lifecycle policy “Evolution without obsolescence”, ABB is committed to our customers for continued support on maintenance for all equipment supplied. The goal of ABB is to protect our customer investments as long as possible and economically reasonable.

Due to obsolescence issues of the 1st and 2nd generation the new Remote Bus Communication Module 88TK60R1210 for the internal system communication will be released in 2017. The modules of the 1st and 2nd generation listed in the table below as well as the current solution 88TK50 with FDDI bus, which will move to Classic with the release of the new remote bus communication module, can be replaced by the 88TK60.

Please bear in mind that with a migration several modifications in the cabinet and also further module replacements may be mandatory.

The 1st generation with 88TK01/02 is already obsolete for several years and the 2nd generation with 88TK05 moved to Limited within this year. The huge amount of modules necessary in the Master Station systems used for the station control and the system communication are no longer necessary after migration to 88TK60 and can be omitted.

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O Obsolete    L Limited    C Classic    A Active
Replacement of Master Station 88TK05R1210 with 88TK60R1210

As mentioned in the last section it is possible to save a lot of space with the migration from 88TK05 to 88TK60 because less devices are required. As shown in the example below a respectable number of modules marked in red which are used for Master Station control and the system communication are no longer required and the number of cabinets can be decreased from four to two.

In the two remaining cabinets the 88TK05 modules can be replaced with the same number of 88TK60. Afterwards the backplane 88IL60 has to be mounted on the rear of the cabinet. In addition the 88FT05 and 88FK05 modules can be removed from the cabinet.

However, with the migration to 88TK60R1210 several points have to be considered. Please take into account that an upgrade of the P14 software is required in any case and keep in mind that several modules of the 1st generation and also the communication modules of the 1st and 2nd generation are not compatible with the 88TK05R1210. In case of any questions please contact your local representative or directly use our contact address on the last page.

The next Evolution of the P14 Manager

Dominik Eifel: “In my new role as Evolution Manager I will focus on directly supporting our local business units with PROCONTROL P14 expertise. Together we can evaluate the possibilities how to manage the system life cycle of each installation in order to protect the customer’s investment and make them fit for the future. This can range from introducing new developed system components over integrating new plant parts (e.g. turbine control) into the PROCONTROL P14 system to developing a long-term evolution plan for a power station. Another focus will be to drive the service strategic initiatives e.g. Power Generation Care concept and to support the local business units to implement them. For further information or if you have any questions please do not hesitate to contact me.”

Dominik Eifel

From 1995 – 2001 Dominik Eifel studied Mechanical Engineering at the RWTH-Aachen, attaining a degree in Mechanical Engineering, majoring in Plastics Processing. During his studies he completed an internship at the German R&D Center.

After gaining much experience working abroad, he joined ABB and has since worked in many different roles focused on turbine control technology in Proposal and Sales departments. In the last six months he has worked closely together with his mentor Günter Herz.

The next Evolution of the P14 Manager

From left to right: Günter Herz and Dominik Eifel

Interview with Dominik Eifel

Dominik Eifel: “In my new role as Evolution Manager I will focus on directly supporting our local business units with PROCONTROL P14 expertise. Together we can evaluate the possibilities how to manage the system life cycle of each installation in order to protect the customer’s investment and make them fit for the future. This can range from introducing new developed system components over integrating new plant parts (e.g. turbine control) into the PROCONTROL P14 system to developing a long-term evolution plan for a power station. Another focus will be to drive the service strategic initiatives e.g. Power Generation Care concept and to support the local business units to implement them. For further information or if you have any questions please do not hesitate to contact me.”

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Dominik Eifel

From left to right: Günter Herz and Dominik Eifel
Power Generation Care

A new way to get the most out of your plant, people and production process

Power Generation Care is a complete service offering that raises the performance of the plant’s automation and electrical assets, its operations and maintenance staff, and the production process during the life cycle of the facility.

It is designed to meet the service requirements of ABB customers worldwide, whether they are a publicly or investor-owned utility or independent power producer, or whether they operate a single plant or a fleet of plants in one or more countries or regions.

Despite their differences and the varying opportunities in the markets they operate in, power generation companies worldwide share three things in common with regard to their service requirements:

- They want to extract more value from their existing assets by extending the lifetime of the plant by an additional 5, 10, 15 or 30 years and be certain that the plant will continue to perform optimally throughout that extended lifespan; and
- They want to optimize the performance of the plant as a whole. This may include improving the production of steam or reducing the consumption of energy or enhancing the knowledge and skills of the workforce throughout their years at the plant.

Power Generation Care is ABB’s response to these customer requirements.

Continuous collaboration

Partnership, life-cycle management and stepwise evolution of the plant’s distributed control system are the defining principles of Power Generation Care.

Partnership and continuous collaboration between ABB and the customer is key. For its part, ABB contributes deep expertise in automation and electrical technologies and the power generation process:

- We are ranked by ARC Advisory Group as the global market leader in distributed control systems, both for the sector as a whole and for critical infrastructure industries like power generation, oil and gas, mining and pulp and paper;
- We are acknowledged by the market as the leader in the power technologies that make up the electrical balance of plant – transformers, generator circuit breakers, motors and drives, and so on; and
- We have vast expertise in power generation processes, based on more than 125 years in the industry.

Plant strategies

This expertise is on hand to meet each customer’s specific requirements and business targets, in particular: their asset strategy for the plant in question, which is usually based on the number of years the plant has left to run; the operating strategy of the plant, whether it runs at base load, peaking load or load-following; and the operations and maintenance culture of the plant or company.

For instance, a plant that has 25 more years of scheduled running time requires a different maintenance strategy than one scheduled for closure within the next few years. The former will require a long-term DCS service program with planned upgrades that evolve the system stepwise over time; whereas the latter may get by with refurbished parts rather than new ones. Similarly, a plant that is running at maximum output around the clock requires a different service approach than one that is ramping up and down several times a day to provide power at peak demand.

And the operations and maintenance culture of a company may differ from one plant to another depending on the skill level of the operators and service engineers. Typically, 80% of the DCS is not used to its full potential. Learning programs can equip staff with the knowledge to use the system to its full potential. This is becoming ever more crucial as we enter the era of big data and the Internet of Things. Services and People, at the heart of which is the plant’s DCS.

Service that meets requirements

Power Generation Care consists of a comprehensive range of solution packages that meet these individual plant strategies and the overriding requirements for day-to-day maintenance, lifetime extension and performance optimization.

These solution packages are the key to our life cycle approach to plant service and our philosophy of evolving the DCS in small incremental steps throughout its lifetime to ensure that it remains up-to-date and free from the risk of degradation and obsolescence.

The packages provide the flexibility to meet the requirements of a customer who operates a single plant and one who owns a fleet of plants of varying ages and in different applications. In both cases we can help identify which service investments are most critical to mitigate risk and reduce service costs. This could mean managing the supply of spare parts in a smarter way, raising the level of cyber security, evolving an outdated HMI to a state-of-the-art interface, or improving the skills and knowledge of personnel.

Power plants have three service needs in common: day-to-day maintenance, performance optimization and lifetime extension.

Global service network

Power Generation Care is available to customers worldwide and is supported by our eight regional power generation service hubs. Contact your local ABB service hub manager for more information.
Procontrol P14 presence worldwide
We are here to support you

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