

CHES

Preventing damage through continuous water-steam chemistry supervision

Chemistry deviations in the water-steam cycle can cause significant damage over time, resulting in unplanned outages and high costs, but they often go unnoticed or are addressed inappropriately.

CHES, ENGIE Laborelec's CHEmistry Supervision Service, identifies potential chemistry issues before they can do serious damage, and gives expert prevention advice and support to plant operators.

WHY

Impurities in the water-steam cycle can lead to corrosion or deposits over the medium to long term, causing early degradation or impacting performance. Unfortunately, these deviations stay mostly under the radar of the Distributed Control System (DCS) or are signalled infrequently. As a result, they can often go ignored by operators because their immediate action is not required.

Smarter **supervision of the water-steam chemistry** is needed to identify potential impurity issues in good time, allowing operators to take the appropriate action. This is increasingly important, because gas power stations now often operate with frequent stops and starts, and there is less in-house chemistry expertise.

WHAT

CHES helps prevent such potentially costly issues by flagging water-steam impurity issues whenever they occur. The service aggregates and analyses the plant's DCS data, calculates chemistry KPIs and signals any deviation. Laborelec chemistry specialists monitor these KPIs, further analyze the data wherever needed, and provide **expert advice** on how to address the issues.

BENEFITS

- ♥ **Preventing chemistry-related issues**
Early identification of water-steam chemistry issues allows plant operators to act before it's too late, avoiding costly damage or performance loss.
- ♥ **Increased insight into chemistry status**
CHES gives better insight into current water-steam cycle chemistry status, even for staff who are not chemistry specialists.
- ♥ **No burden, no worries**
The service removes the burden of analyzing data and identifying issues from operations staff. The monitoring and follow-up service provides the solid reassurance that comes from any good insurance policy.

OUR ADDED VALUE

- ♥ **Comprehensive chemistry expertise**
The CHES service is provided by a highly-skilled team of chemistry experts with comprehensive experience in monitoring and tuning the chemistry of power station water-steam cycles. This is especially important given the decline in chemistry expertise at power stations.

HOW DO WE IMPLEMENT CHESS?

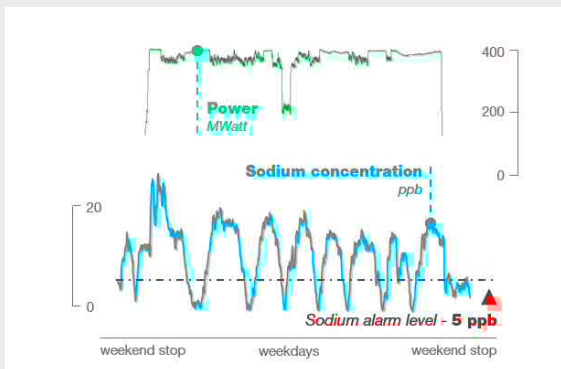
CHESS can be put into operation at any power station or power generating industrial site. First, we conduct an onsite review of the plant's water-steam circuit. We then set up automatic data retrieval, conferring with the plant operator to define, tune and implement the reporting.

KEEPING AN EYE ON IT

Back at base, we keep an eye on the system's chemistry parameters and KPIs at regular intervals, as agreed with the plant operator. In the event of a deviation, we further analyze the data, which may then lead to operational or maintenance recommendations.

Adding intelligence to the DCS - An example Detecting the entry of sea water into a condenser

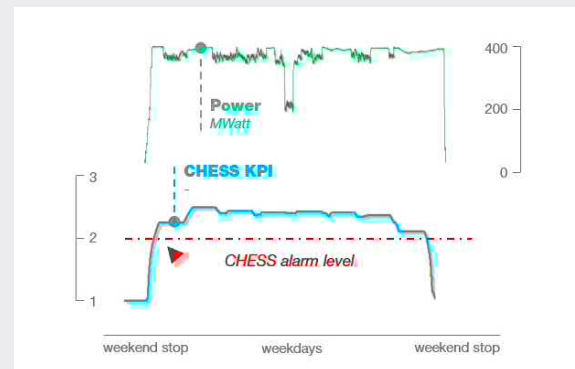
The graphs below show how a particular phenomenon - the entry of sea water into a condenser - is viewed in very different ways by the DCS system and by CHESS. While the DCS is limited to signalling the status of individual parameters at a given time, CHESS aggregates these values over time and continuously calculates a series of multi-factor KPIs. By adding intelligence to the DCS, CHESS can, at an early stage, signal deviations that would normally have gone unnoticed.



What the DCS sees using a conventional marker: sodium concentration

Sodium alarms are signalled intermittently by the DCS, but the lack of a consistent alarm results in the underlying problem going unnoticed for several days. In this scenario:

- ♥ troubleshooting is difficult;
- ♥ high probability of no action by the operator.



What CHESS brings using specific KPIs and expert analysis

Automated CHESS calculations clearly indicate permanent deviation in the multi-factor KPI, with the alarm level being already overstepped on the first day. This triggers the intervention of a chemistry expert who carries out an analysis and gives advice on managing the situation and how to prevent damage or performance loss. In this scenario, where a minor condenser leakage is detected, no stop is required provided:

- ♥ blowdown is carried out when cation conductivity in drums reaches its limit;
- ♥ a proper leakage search (detection) is carried out at the next outage.

Would you like to know more?

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