MERUS RING TECHNOLOGY FOR BOILER FEED WATER TREATMENT

ZULKIFLI AB RAHMAN and YAHAYA HAWARI

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The milling process depends on good boiler operation to supply steam and power for the production of crude palm oil and palm kernel. Palm oil mill boilers produce 20 to 40 t hr^{-1} steam for power generation as well as for process heating. The steam boiler operation requires proper boiler water treatment, regular water analysis and adequate regulated blow down. It also requires maintenance, periodic safety checks and follow-up inspections. Sources of palm oil mill boiler water include rivers, reservoirs and ground water. Water tends to cause problems in boiler such as forming deposits and interfering with heat transfer as well as damaging metals and other materials of construction if they are not treated properly.

In the case of corrosion, it is almost impossible to bring the same amount of chemicals to all parts of the system. Owing to this limitation, corrosion is not effectively prevented. The new boiler water treatment system using Merus technology removes lime scale, rust and corrosion in the steam boiler. It requires no power to operate and can easily fit into any pipe regardless of its size.

MERUS RING TECHNOLOGY PRINCIPLE

Merus ring is a software-based technology that works by changing the physical behaviour of the ingredients in water. It does not however alter any chemical properties of the water. By the use of oscillations emitted by the Merus ring, many harmful side effects that occur in the piping system and equipment can be reduced. Merus water ring is easy to fix at the external boiler feedwater piping. The ring comes in two halves which are secured around a pipe with two bolts (*Figure 1*). The device is installed around the water pipe to be treated (*Figure 2*). Micro-fine oscillations influence the water in such a manner that more lime scale is dissolved. The existing rust is broken down and flushed out.

Figure 1. Merus ring device.

Figure 2. Installation of Merus ring technology at boiler feedwater pipe.

RESULT AND DISCUSSION

The overall chemical usage for initial boiler feedwater treatment showed a significant reduction in quantity after installation of the Merus ring boiler treatment. Usage of catalysed sulphite, adjunct HL, ametrol, Adv Plus and PDV salt was reduced by 22%, 14%, 21%, 30% and 54% respectively.

The high amount of total dissolve solids (TDS) can cause carry-over of boiler water into steam, causing damage to piping, steam traps, turbine blade and even process equipment. Merus technology helps to reduce TDS in the water so that it is always below 1290 ppm. This

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Malaysian Palm Oil Board, Ministry of Plantation Industries and Commodities, Malaysia
P. O. Box 10620, 50720 Kuala Lumpur, Malaysia. Tel: 03-8769 4400 Fax: 03-8925 9446 Website: www.mpob.gov.my

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will automatically minimise energy loss, water consumption, fuel and treatment chemicals needed during operation.

The downtime for cleaning maintenance is significantly reduced by half from eight days to four days during the annual boiler inspection. The number of workers needed for the cleaning and maintenance of the drum and tube is reduced by half because the drum and the tubes are easy to clean.

Figure 3. Inlet pipe to steam drum before installation of Merus ring technology.

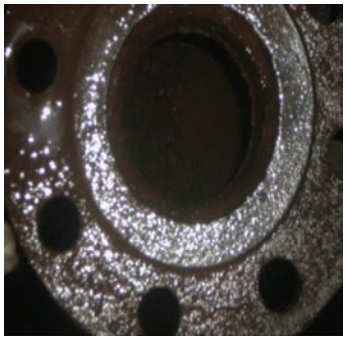

Figure 4. Inlet pipe to steam drum after installation of Merus ring technology.

CONCLUSION

The Merus ring unit emits natural, molecular or bio-signal oscillations into the boiler feed-water. The oscillations are propagated in the water primarily in the flow direction and induced to act against scale and corrosion. The system reduces chemical treatment during running of the boiler, reduces number of workers and downtime during yearly boiler cleaning maintenance. With the capabilities of Merus ring to change the behaviour of any dissolved mineral solid in boiler feedwater which has the potential to cause deposits at the surface of boiler tubes and steam drum, the heat transfer in the boiler will automatically increase, thus improving the boiler efficiency.

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For more information, kindly contact:

Director-General
MPOB
P. O. Box 10620
50720 Kuala Lumpur, Malaysia.
Tel: 03-8769 4400
Fax: 03-8925 9446
www.mpob.gov.my