



CLEAN OIL
BRIGHT IDEAS

Gear Oil / Gear Flushing Wind Turbine Gearbox, 1.5 - 2.0 MW

CJC™ Application Study

Application Study
written by:

Lydia Li Mei Wen
C.C.JENSEN
Filtration Equipment
China

2014



CUSTOMER

Chongqing Gearbox, China.
A subsidiary of CSIC group, which amongst others, provide gearboxes to DEC, CSIC, Goldwind and United Power.

SYSTEM

Turbine: Gearbox, 1.5 / 2.0 MW
Oil type: Mobil SHC XMP 320
Oil volume: 300 - 400 L

PROBLEM

Chongqing had tried both domestic and international suppliers of gear flushing equipment but none of them could reach the customer requirement of ISO code 17/15/12. This led to very long and high electricity consuming flushing processes without reaching the wanted result.

SOLUTION

Due to poor experiences with other players in the market, Chongqing was very reluctant when C.C.JENSEN presented their new **CJC™ Gear Flushing Unit (GFU)**. It was agreed to run a test on sale on return conditions with the objective to reach and document an ISO code of 17/15/12 in 3 hours.

RESULT

The gearbox flushing started with a 4 micron contamination level of 3,000,000 particles per 100 ml. In less than 2 hours this was reduced to below 50,000 reaching the objective of the test faster than promised. In other words, the contamination level was reduced with a factor 60 in less than 2 hours.

FINANCIAL BENEFITS

- The CJC™ GFU cleaned more than 300 gearboxes on the first set of filter inserts. This resulted in a filter insert cost per gearbox as low as 32,- USD. Much lower than the previous filtration system, where the filter inserts had to be changed frequently at a higher cost
- The reduced flushing time gave the customer a saving in electrical costs equivalent to 160,- USD per gearbox
- The GFU had a break-even in less than one year

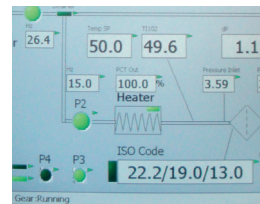
OTHER BENEFITS

- Increased production capacity as flushing process is dramatically shortened
- Time saving, as documentation to Chongqing's customers is automatic, where previously it had to be performed by using labour intensive oil samples
- Automatic flushing processes with documented results
- Oil savings as the lifetime of the flushing oil is increased

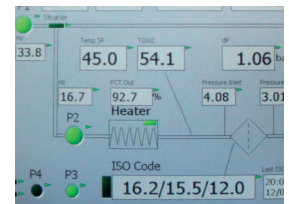


CJC™ Gear Flushing Unit, GFU, flushing a Chongqing gearbox

GEAR FLUSHING CONTROL PANEL

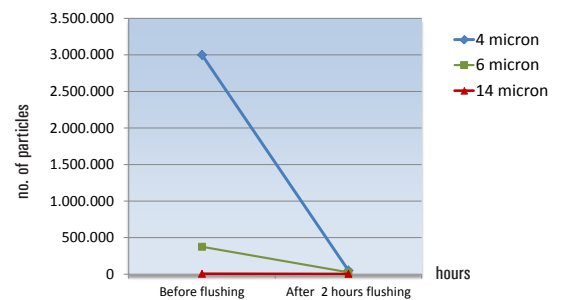


ISO codes, **BEFORE** starting up flushing procedure



ISO codes, **AFTER 2 hours** of flushing with CJC™ Gear Flushing Unit, GFU

PARTICLE DEVELOPMENT



RESULT

pr. 100 ml	BEFORE	AFTER 2 HOURS
> 4 micron	3,000,000	50,000
> 6 micron	375,000	25,000
> 14 micron	6,000	3,000
ISO Code	22/19/13	16/15/12

COMMENTS

Mr. Zhang Li, Chongqing Gearbox:

"Not only flushing the gearbox to be at a required cleanliness in a short time, but we also saved electricity for more than 160,- USD for each gearbox due to the high efficiency using the CJC™ GFU."