MITSUBISHI HEAVY INDUSTRIES COMPRESSOR CORPORATION

Mar. 12, 2012

T-E-010 / 766-90171

Online washing system

REASON FOR SUGGESTION:

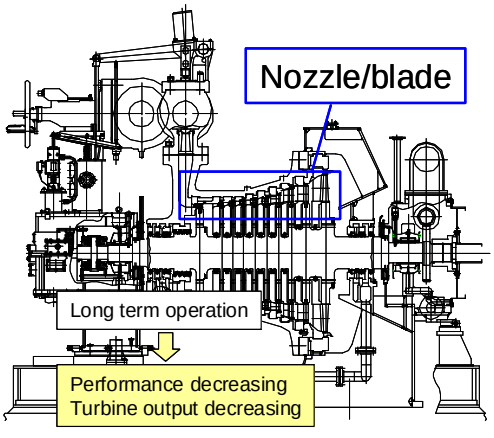
In case of long-term continuous operation, fouling such as sodium and silica may deposit and accumulate turbine internal. As fouling gets worse, the pressure drop across the turbine increase to mechanical limit. The severe fouling is refracted in terms of higher after stage pressures, lower steam flow rate and loses output power due to flow rate decreasing.

Conventionally, hot water washing has been applied to wash turbine internal with out turbine overhaul. But it required several days shutdown.

New developed online washing has significant economic advantages. Production remains so that all of the derivative units are able to keep running during the wash.

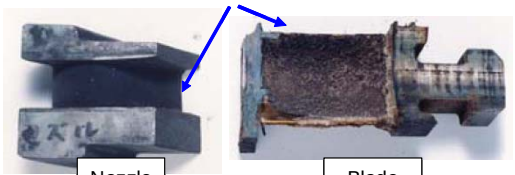
DETAILS OF SUGGESTION:

1) Online wash can be applied to straight condensing turbine or extraction condensing turbine. Installation of system can be done by replacing governing valve and extraction control valve.
2) Fouling material on turbine internal will be washed out by higher moisture steam comparing with normal operation.
3) The machine will keep running at its normal rated speed. Online washing has proven to be an effective option for improving turbine performance while continuing to produce.



Fouling condition After 7years continuous operation

Fouling (silicate, sodium etc.)



Nozzle

Blade

MCO Head Office
Customer Service Division
4-6-22, Kan-on-shin-machi, Nishi-ku, Hiroshima, 733-8553 Japan
Phone: 81-82-291-2082
FAX: 81-82-294-1663

Mitsubishi Heavy Industries Compressor International Corporation
14888 Kirby Dr. Pearland, Texas 77047, USA
Phone: 1−832−710−4700
FAX: 1−832−710−4600

Mitsubishi Heavy Industries Europe, Ltd.
Building 11, Chiswick Park, 566 Chiswick High Road, London, W4 5YA, United Kingdom
Phone: 44−20−3480−7500
FAX: 44−20−3480−7501

MHI Compressor do Brasil Ltda.(MCO-B)
Avenida Doutor Morato 190, Sala 01, Vila Rezende, Piracicaba, Sao Paulo, SP, Brasil
CEP: 13405-260
Phone: 55−19−2534−2003
FAX: 55−19−2532−2829

MCO Saudi Arabia, LLC. (MCOSA).
P.O. Box 3782, Al-Khobar 31952, Kingdom of Saudi Arabia
Phone: 966-13-896-5354

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Steam inlet

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Water injection

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Increase steam wetness

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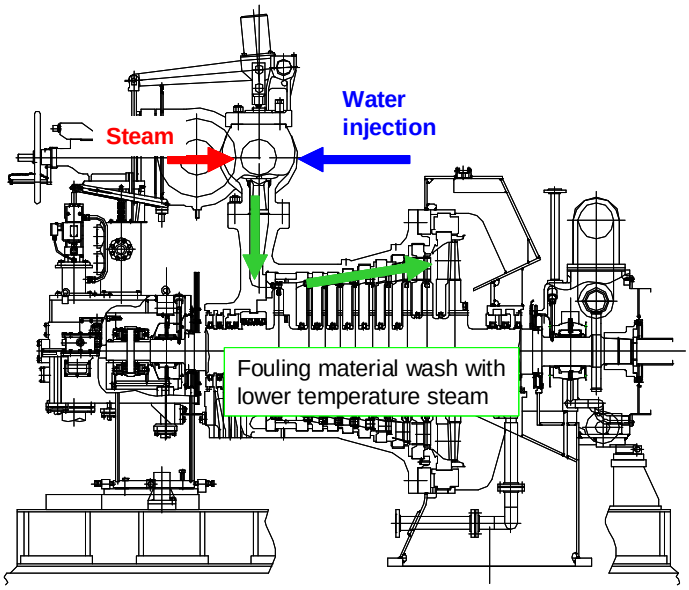
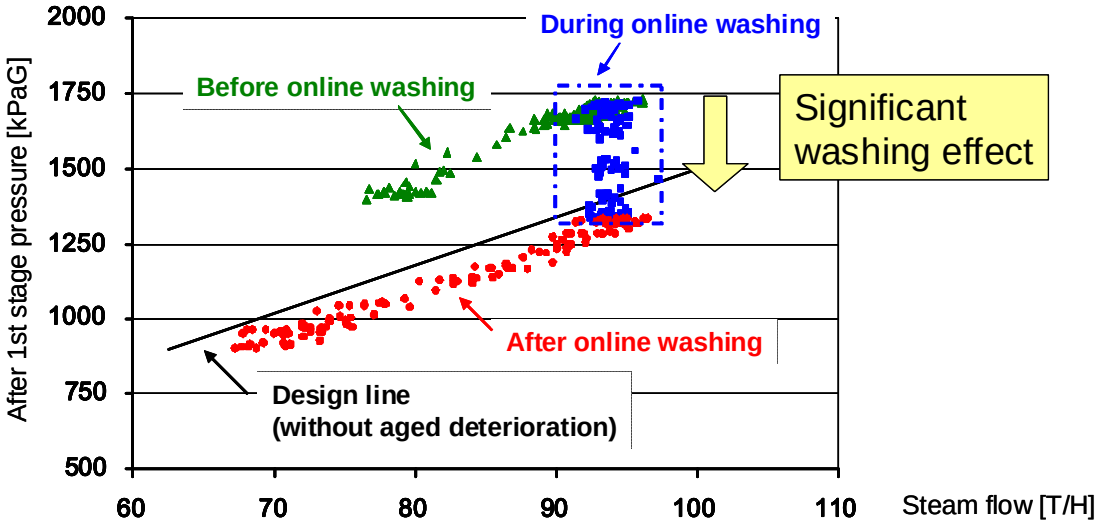
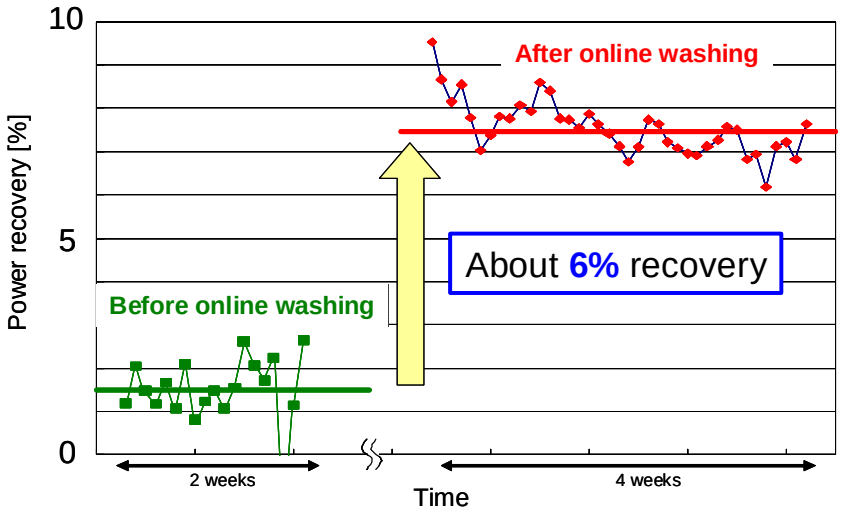
Fouling materials are dissolved







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- Turbine performance deterioration is occurred by long term operation and fouling material in steam.
- As a countermeasure of performance deterioration, due to above reason, MCO recommends to apply online washing system.
- After 1st stage pressure and output power recovery are confirmed from verification in field.

The detailed study is required for the application of online washing system. Therefore, if you have interest in this washing system, please inform us following information.

- Boiler feed water pressure
- Boiler feed water temperature

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