MITSUBISHI HEAVY INDUSTRIES COMPRESSOR CORPORATION

Mar. 12, 2012

T-S-002 / 766-90172

Improvement of service life of turbine blade in wet region

REASON FOR SUGGESTION:

A condensing turbine being operated in a wet steam region may have its blade surface erosion due to drain produced during long-term operation, leading to an accident of broken blade(s) in a worst case as well as reduction in efficiency.

DETAILS OF SUGGESTION:

Replace the blades (application limit of blade height : 200 mm) in a relatively high wet (＜10%) stage with those so-called ceramic-ion plated which are Nitrided titanium (TiN)-top coat and chrome (Cr)-under coat. Thereby, higher erosion resistance and longer service life will be obtained.

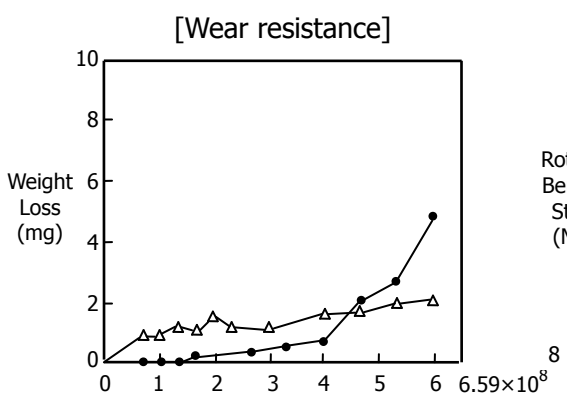

Fig.1 Cavitation Erosion Curves

● Cr-TiN IP
□ Stellit (Soldering)

[MHI test data]

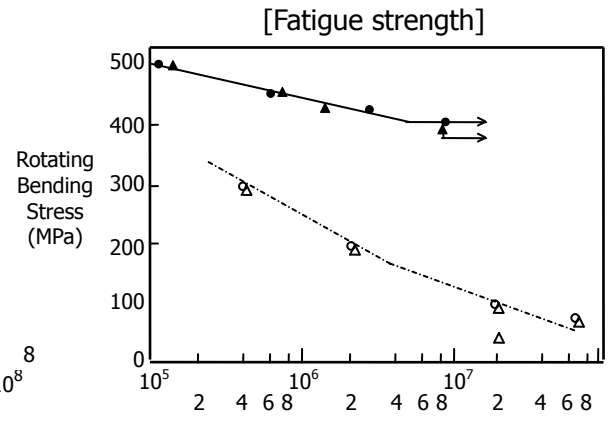

Fig.2. S-N Curves

Material	Environment (Room temp.)	
	Air	3% NaCl
Base Metal	●	○
TiN Coating	▲	□

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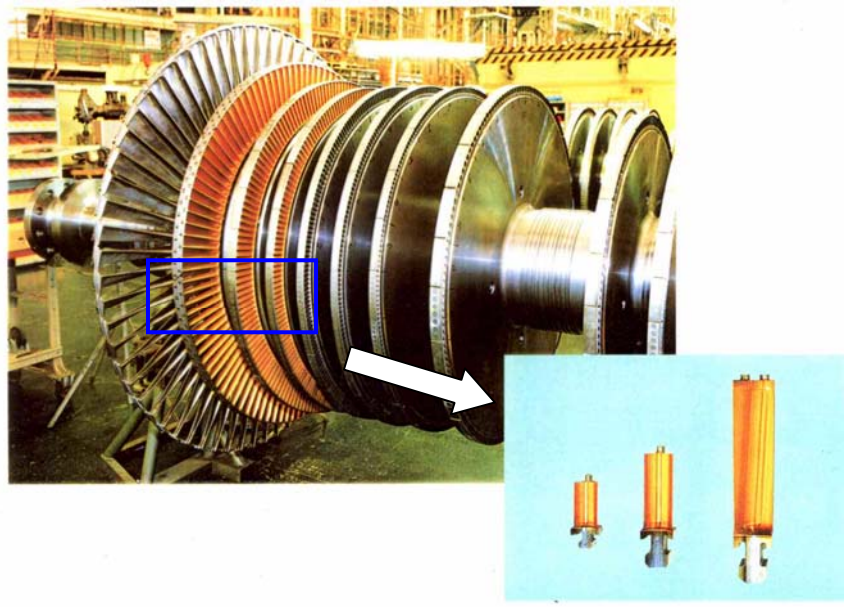

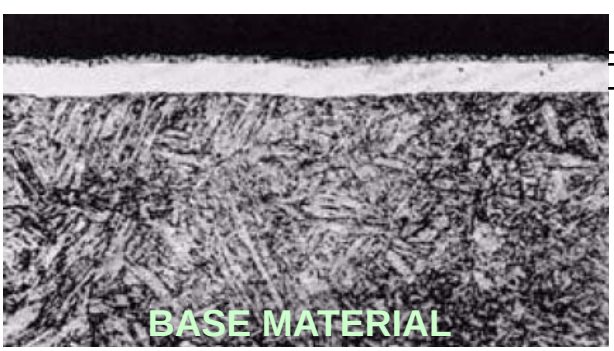

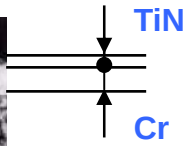

Base material	: about Hv 200
Ion plating	: about Hv 1500

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