

DETAILS OF INTERESTING CLAIM

INTEGRATED COMBINED CYCLE GAS TURBINE

Type of Insurance:

“All risks” (PD + BI including Machinery breakdown)

Description of the Power Station:

The risk is a Thermal Power Station (gasification combined cycle type), where the gas burned into GT (Syngas) is obtained by a gasification process of heavy oil feedstock; The plant is in operation since 1999 and the loss occurred on October 2008. There are essentially two distinct trains composed mainly by:

- 2 x SynGas Turbine
Year of construction: 1997
Power: 2 x 160 MW
- 2 x GT Generator
Year of construction: 1997
Power: 192 MVA
Output voltage: 15 KV
- 2 x Steam Turbine
Year of construction: 1997
Power: 2 x 100 MW
Velocity: 3000 rpm
- 2 x ST Generator
Year of construction: 1997
Power: 192 MVA
Output voltage: 15 KV
- Gasifier unit
- Heat Recovery Steam Boiler

Description of the damaged item:

Syngas turbine: the rotor and stator blades have been distorted or destroyed and the casing has broken.

The GT generator has been completely destroyed

Heat Recovery Steam Boiler: extensive damage has occurred

Other damages occurred on the Flue gas duct

Claim cost

PD: extensive damage to the HRSG and power train huge cost amount under evaluation

BI: business interruption period estimated in the maximum of 20 months, CBI involved since the plant damaged cannot buy asphalt, needed for the process, from the refinery.

Total amount: under investigation

Description of the event:

This claim occurred on the train n°1 during the maintenance functions.

According to the maintenance procedure the syngas turbine was stopped and the safety valves closed to stop gas flowing to the turbine and to precede maintenance works.

After the operations have been finished, due to a valve having been inadvertently left open, the gas flowed into the turbine and subsequently into the recovery steam boiler.

In only five minutes the duct, turbine and boiler were full of gas.

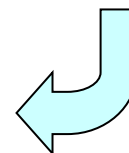
Apart from the trigger, at the moment unknown, we are quite sure that an explosion started from the boiler and consequently a TG overspeed caused an additional tremendous damage, as shown below.

We would underline that all the operations above were made by operator.

Pictures

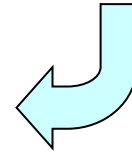


**Remnants of
the compressor
rotor**

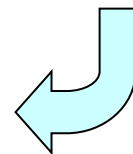




**Remnants of
the turbine
rotor**

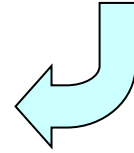


**Turbine centre
casing with
sheared bolts**

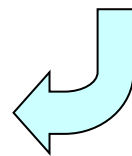




Broken shaft

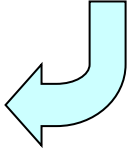


**Damaged ducts
within the base of
the flue gas stack**

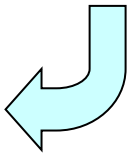




Damaged flue gas duct

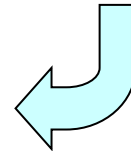


Bulged water wall tubes to boiler

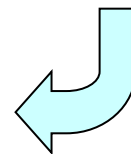




Damaged generator



**West side view of
the boiler**



Possible Loss Prevention measures; lesson learned:

What is clear in this happening? The human error is once again upstream of a big disaster. The operator was an employee with 8 years of experience, including many shut downs and starts ups, but clearly this was not enough to prevent the accident. Prevention measures for this case are certainly all a Company can do for the training of his employees; even better, for example, should be develop a new procedure consisting of a “four eyes principle” for the more dangerous operation steps.