

DETAILS OF INTERESTING CLAIM

No: DOIC 65 (CAR)

Type of Insurance:

EAR

Description of damaged item:

Boiler:

Cause of Loss:

(2) Faulty material or workmanship at boiler

Claim Cost

600 000 €

Description of Incident and Loss Prevention Measures initiated:

In the 60's, Soviet Union manufacturers installed boilers, steam turbines and generators in a Power Plant in Romania. At the end of the 90's, the local operator decided to improve and retrofit the two main boilers.

Subject of the retrofit was:

- Automation and computerising of the process (hot start, fast stop/fast start)
- Restoration of wall insulation
- Exchange and increase of number of overheater pipes (six layers of pipes in front of the burners)

One of the major difficulties of this project was the lack of documentation from the original design and the history of modification.

A Western contractor won this revamping works contract.

Works took place from 1999 till end of 2000.

Commissioning phases started in the early 2001. During commissioning, several fast stop/fast start and hot start were experienced.

During a test, vapour pressure decreased suddenly and water level dropped.

A first investigation discovered a broken pipe, and a colour change was noticed on several other pipes.

After analysis, it was concluded that the vapour flow had been stopped in the pipes. Due to the high temperature near the pipes - they were located near the burners - they were overheated. One pipe even burst out; the others suffered metallographic modifications. After further investigation about causes of the phenomenon, the Western contractor discovered that a main horizontal collector pipe was connected to the vertical pipes at the bottom of the boiler. This pipe was not reported in the documentation and drawings available and there was also no information on any level control systems.



This pipe had been installed in order to collect condensate vapour, but no drain pipe has been observed.

The contractor had to conclude that during hot start - fast stop /fast starts tests, condensed vapour had reached a high level and the horizontal collector was full of water. The vapour flow was restricted or purely stopped, so no vapour flow was circulating in the pipes, which were overheated.

Damages suffered:

- One pipe broken,
- Several pipes with metallographic change, which were considered as totally damaged
- Several pipes with small metallographic modification

Repairs engaged:

Due to the specific pipe configuration (quantity and geometry), an exchange pipe per pipe was not possible and a complete layer change had to be programmed (three on six)

Delay for delivery of new pipes was about one year. So, in order not to stop the commissioning and electricity generation during the winter period, the main part of damaged pipes was blocked temporarily.

As the exchange could not be done on the inner side of the boiler, the wall had to be cut, insulation to be dismantled, pipes to be cut then the new pipes assembled and the wall rebuilt.

The repairs took three months, and costs reached about 600 000€.

To avoid this loss, the technical solution should have been:

- Visual inspection of existing pipes networks and compatibility with existing documentation
- Installation of a drain on the collector
- Modification of the hot start, fast stop /fast start processes to avoid a too high condensate.

(From [Revamping and modernisation of machinery and equipment](#) Concepts for coverage including testing and commissioning, IMIA Paper WGP51 (07)E)