

DETAILS OF INTERESTING CLAIM

(From Human Factors in Engineering Risk - IMIA Paper WGP8 (00)E)

No: DOIC37 (M)

Type of Insurance:

M

Description of damaged item:

The boiler damaged as a result of continued firing on low water level

Cause of Loss:

(1) Faulty operation

Claim Cost

Description of Incident and Loss Prevention Measures initiated:

Occasionally a loss appears to have so many contributory factors that it is difficult to ascertain immediately when the problems actually arose. One such event occurred at a boiler located in a South African pulp and paper mill, which was fired with 'black liquor' (a combination of lignin and chemical salts in liquid form). The co-axial tubes of the boiler were severely damaged as a result of continued firing on low water level.

Fortunately no tubes failed, if they had the consequences could have been catastrophic due to the effect of water on the sodium salts. However, it was necessary to retube the entire furnace.

Outline the interesting or unusual aspects of this claim or problems experienced during settlement:

Some of the contributory factors to the loss were identified as a severe lack of maintenance of the boiler controls. This included:

- The prime safety device, the water gauge glass, was completely obscure and had not been repaired even although there had been a recent outage.
- A secondary water level cut out device had been disconnected (apparently for some time).
- The connections to the differential pressure devices from the boiler were fitted using inappropriate techniques (including PTFE tape and screwed connections).

Due to the poorly maintained gauge glass and disconnected secondary level control device, the entire water level control of the boiler was dependent on 3 comparators, the computer monitoring the level being programmed to recognise the best 2 of the 3 signals. Unfortunately the arrangement of the 3 comparators (essentially differential pressure transmitters) providing these signals was such that 2 of them were connected to a common pressure leg. When the pressure leg connected to the 2 devices developed a leak due to the inappropriate connection described above, the computer was taking this incorrect signal to be correct. Even at this stage it would have been possible for the operator to take action. The one correctly reading indicator, connected to the pressure leg which did not develop a leak, could have been viewed on the display screens but was not, and, during the later stages, it was reported that the boiler was making some rather unusual noises.

The control equipment was virtually non-existent and there had been a failure to intervene at

multi levels in the human area. Even so, by appreciation of cultural differences and perhaps more importantly to assist local managers in tackling what may be extreme local cultural variations, it is possible to tackle the situation. In this type of case intervention is required at the highest levels. Contextually, consideration of the geographical setting was required and there was an immediate need to upgrade the basic technology. Simultaneously the structure required significant change, including the need to establish thorough training of personnel at all levels, providing an appreciation of the hazards of the process, and there was an overwhelming need to change the climate from one of apparent oppression. The changes had to be appropriate, with an appreciation of the cultural variations. For example workers at the lower levels may be illiterate, they may understand little of the dominant language, and in any case the spoken word may have more meaning than written procedures.

CODES

1. Type of Insurance

M - Machinery Breakdown

BE - Boiler Explosion

LP (M) M - Loss of Profits

ALOP (DSU) - Advance Loss of Profits

EAR - Erection All Risks

CAR - Contractors All Risks (Civil)

G - Guarantee

EE - Electronic Equipment

O - Other Classes

2. Cause of Loss

(1) Faulty operation

(2) Faulty material or workmanship

(3) Faulty design

(4) Other internal causes

(5) Fire

(6) Explosion

(7) Storm

(8) Earthquake

(9) Other external causes

(10) Other causes or unknown