

## **BOILER ACCIDENTS CAN GENERALLY BE PLACED IN THREE CATEGORIES**

### **CONTROL FAILURES**

Preventive maintenance and regular testing of control systems is necessary to help ensure reliable and effective operation.

- A high percentage of boiler low water accidents are caused by the failure of the operator or person in charge to safely remove sediment including scale, mud or other debris that steadily accumulates in the float chamber of the boiler low water fuel cut-off assembly. The float chamber must be drained and flushed regularly to remove sediment or float action will be limited, and thus impair operation of the fuel supply cut-off in the event of boiler low water level.
- At regular intervals, it is also very important to clean the piping between the boiler low water fuel cut-off assembly and the boiler. Neglecting to clean this piping may result in restricted water or steam flow which may prevent normal operation of safety devices.
- Poorly maintained or improperly installed electrical components/wiring/terminals are sources of operational problems, failures and accidents especially those associated with boiler water level control, feed water pump control, and boiler low water fuel cut-offs and switches.

### **EQUIPMENT FAILURES**

Equipment failure other than control and safety device failures can also contribute to boiler low water accidents. Equipment failures may include:

- Failure of the boiler feed water pump motor or electrical contactor
- Vapour lock of the boiler feed water pump or the condensate pump
- Defective or worn parts within the boiler feedwater pump
- Worn or defective check valve or clogged strainer in the boiler feed water line
- Blown fuse or tripped circuit breaker All of the above can be the cause of a boiler low water level condition which may lead to overheating in the event of a simultaneous malfunction of the control or safety devices.

### **OPERATIONAL ERROR**

Heating plant owners should very carefully select and train personnel who will be responsible for the operation and maintenance of boilers and auxiliary equipment. Operational error continues to be a major component in the cause of boiler failures within Alberta. Inexperienced or improperly trained personnel tampering with controls, wiring, or peripheral components often cause boiler low water accidents. A common error occurs when boiler low water fuel cut-off and boiler feed water pump control wiring connections have been reversed or interchanged. Another common cause associated with operations is that the person responsible does not effectively test critical components after finishing maintenance work.

### **WARNING**

Many accident reports indicate that a switch or a valve or other safety-related device was either inadvertently or deliberately blocked open or closed some time prior to the accident. Ensure valve(s) are

not installed between safety relief valve or low water fuel cut-off and the boiler.

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