Hydro Aluminium counts on new safety technology from ESSER

Reconstruction of the CO_2 extinguishing system in the worldwide biggest aluminum fine strip roll mill

Whoever treats himself to a refreshing canned beverage after some sweat-inducing activity rarely thinks about the manufacturing process needed to produce such a container.

More than 500,000 tons of rolled products are produced annually at Hydro Aluminium in Grevenbroich, Rhineland, and then dispatched worldwide. Almost 1,900 employees guarantee for the trouble-free production and marketing of beverage cans, components from the automotive and ship-building industries, facade and ceiling coverings, offset printing plates for the daily newspaper, as well as many other things.

Reconstruction without production loss

In order to guarantee a secure production sequence, the reconstruction of a CO_2 multi-area extinguishing system in the aluminum-foil-rolling mill was recently due. The production standstill was to be kept to a minimum. 14 extinguishing areas had to be taken into consideration. The representation of all states of the extinguishing systems was to be visualized on a superordinate hazard detection system.

To solve this problem, the installation specialists at GST Gesellschaft für Sicherheitstechnik mbH were called upon. Located in Mülheim an der Ruhr, they have been using the products of the European market and technology leaders in fire detection since the founding of the company more than ten years ago. Since 2001, GST have been DIN ISO 9001 certified and have had both VdS 2129 and DIN14675 approval since

January 2003. GST are installation specialists for fire alarm systems, extinguishing systems, intruder alarm systems as well as for access control and video monitoring systems.

Planning stage determines success

A project such as this restructuring of the extinguishing areas at Hydro Aluminum requires a detailed planning stage. A strategy was therefore worked out early on with the persons responsible, one which allowed for the reconstruction without serious influence on production. The decision was made to carry out the work over the Easter holidays in 2006 since the new technology to be used could facilitate fast installation without having to make the usual changes in the remaining pipeline installation of the CO_2 low-pressure system.

Conversion for dummies

The existing cabling was easily taken over into the new upright electrical cabinet and placed on the new connection consoles. These had already been attached to C rails via cable ducts at the mounting wall of the electrical cabinet earlier on. Only after finishing the jumpering and corresponding polarity measurements were the individual fire extinguishing agent slide-in units then connected to the connection consoles via plug-in connecting leads. These slide-in units were then turned on consecutively and corresponding functional tests were carried out. A great advantage was the possibility to be able to program and parameterize the slide-in units in advance. Precious time could be saved in this way during the reconstruction phase.

Graphic visualization facilitates optimal action

The simple arrangement and the quick construction of the extinguishing control panels facilitated the reconstruction of the system within 2 days. Thus the production loss was reduced to a minimum.

All information from the entire extin guishing system is visualized in the WINMAG graphic management system and can be read at any time by the company fire department service and by the company security officers. This guarantees quickest reaction times in case of emergency and that one is informed of the exact local conditions. All reports (such as "extinguishing control blocked"), fading, disconnections, and pre-warnings are indicated at two work stations — both with the fire department and with the company security.

The on-site fire department is able to access every networked fire alarm control panel and fire extinguishing control unit and is always informed if a fire or a fault occurs. In the entire redundant system, several fire alarm control panels are already networked from other sections:

1 x FACP 8008
1 x FACP 8007
2 x FACP 8000 C
4 x FACP 8000 M
5 x **IQ8**Control M

Meanwhile, a total of 44 model 8010 extinguishing control units are connected to the fire alarm control panel network for optimal protection of the employees and the production equipment, forming a homogeneous security concept.

Some key data for the overall system design:

- CO_2 extinguishing system with a 30-ton low-pressure tank
- 14 units of 8010 series 3 fire extinguishing computer in 19 inch design inside 2 floor-type cabinets with hinged frames
- In addition to 6 aluminum roll stands, the following belong to the protected area: Two exhaust channels, three hydraulics vaults, two roll-oil tanks and an exhaust purifier. The extinguishing control panels had to fulfill certain end conditions, for example the possibility to control 14 distribution valves with a flooding time of 120 seconds, 8 tank valves with a pre-alarm time of 20 seconds, 14 interlocking devices, 3 detector zones per extinguishing area, 14 machine emergency-stop switches, 14 resource shutdowns, 16 tableau controls (extinguishing system initiated), 20 monitored acoustic signaling devices, 20 monitored flashers as well as 14 "distribution-valve controlled" check-back signals.

Only consistent preliminary planning and the professionalism of the installation companies made it possible to successively raise the safety standard to a modern and high level in this sensitive object without producing an appreciable loss of production. Among other things, this was enabled by GST, having been able to plan and calculate early on with the new extinguishing control unit in a space-saving 19-inch slide-in variation.

From left to right:

The low-pressure tank of the CO_2 extinguishing system holds 30 tons of carbon dioxide

A total of 14 fire extinguishing computers from the 8010 series can be fit into 2 floor-type cabinets with hinged frames

The existing cabling was easily able to be placed onto the new connection consoles