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Gohr

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(54) **METHOD AND TOOL FOR AUTOMATIC DISTRIBUTION OF CONTROL CODE IN A SAFETY SYSTEM**

(56) **References Cited**

U.S. PATENT DOCUMENTS

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5,361,198 A 11/1994 Harmon et al.
6,369,836 B1 * 4/2002 Larson G05B 19/0426
715/763
6,448,982 B1 9/2002 Klapper et al.
(Continued)

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FOREIGN PATENT DOCUMENTS

EP 0624824 A1 11/1994
EP 2053786 A2 4/2009
WO 2009089914 A1 7/2009

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OTHER PUBLICATIONS

International Preliminary Report on Patentability Application No. PCT/EP2010/059036 Dated: Sep. 5, 2012 60 pages.
(Continued)

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(57) **ABSTRACT**

A method in an industrial safety system for controlling a process or equipment, which industrial safety system includes components with safety devices. The safety system enables signals to be generated as a result of an event or alarm, where the method includes creating an automated link between the event or alarm and an effect or an action to be taken upon receipt of the event or alarm signal due to the event. The method includes configuring one or more links between the event and the input, thus forming a cause and effect matrix, and also generating a control code using the cause and effect matrix for subsequent download of the control code to at least one process controller whereby a control signal is subsequently generated by at least one safety controller to initiate the action or effect.

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G05B 19/042 (2006.01)
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See application file for complete search history.

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