Concerning industrial plants, operators face the problem that more alarms are generated than can be physically perceived and addressed by a single operator. Such a situation is called alarm flood. The main reason for alarm floods are causally related disturbances, which either way raise an alarm, based on a single causal disturbance. These dependencies are difficult to recognize during the engineering of an AMS (Alarm Management System). However, the alarms are logged and stored as time series (historical data). Information about the alarm types and the time stamps of their occurrence can be used to analyze the time series data and thus finding dependencies between different alarms. This contribution presents an approach to find temporal dependencies between alarm events in an alarm time series. Therefore an algorithm was designed, implemented, and evaluated to detect temporal dependencies in alarm time series.