

TOPIC: Hydrogen production

HYDROGEN BASED SYSTEM FOR EMERGENCY POWER SUPPLY

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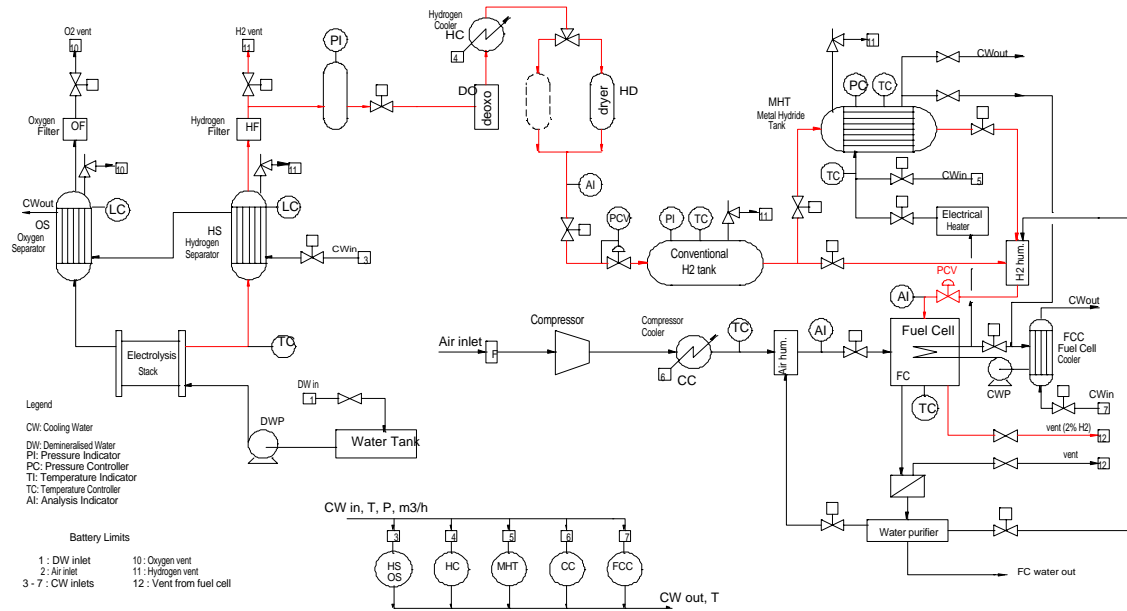
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The heart of an emergency back-up or uninterrupted power supply is generally a battery, which can provide an electrical autonomy of a few minutes. In order to cope with longer electrical power interruptions, the battery can be charged by a diesel generator set (UBS - uninterrupted battery system). Such emergency power systems, supplying 5 kW for a duration of 5 to 10 hours, are often used in telecommunication applications, for replay stations that are connected to the electricity grid but where power interruptions are frequent due to the remoteness of the locations.

This paper presents such an emergency back-up power supply system that is based on hydrogen technologies, which has several key advantages over the conventional systems, such as high reliability, low maintenance costs and noiseless operation. Additionally, unlike conventional gen-set based systems, there is no need for any refuelling of the gen-set since the proposed system re-generates the required fuel (Hydrogen) locally.

The Hydrogen system is composed of hydrogen generation and storage units and a proton exchange membrane fuel cell. A pressurised water electrolyser has been identified as the optimum choice for hydrogen generation, while a combination of a conventional buffer tank with a metal hydride tank has been found to be the optimum way of storing hydrogen. The efficiency and reliability of the system are increased by storing also the oxygen which is produced simultaneously with the hydrogen by the electrolyser. Oxygen can therefore be supplied to the fuel cell instead of air.

some more technical details here....



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