

Title (en)

Steam cycle for a steam power plant.

Title (de)

Dampfkreislauf für Dampfkraftanlagen.

Title (fr)

Cycle à vapeur pour installation énergétique à vapeur.

Publication

EP 0158629 A2 19851016 (DE)

Application

EP 85890073 A 19850321

Priority

AT 98484 A 19840323

Abstract (en)

1. Double steam cycle for a steam power plant, with heat input for power production from high quality heat, in which case the two steam cycles are combined in the high temperature region and the full cycle mass flows are heated by external heat input, by guiding over heater surfaces, and said full mass flows are expanded in a high temperature steam turbine, providing thus useful power as driving power to an electric generator, at which part of the steam expanded in the high temperature turbine is further expanded in a condensing turbine from which steam is bled for feed heating, and the steam flow thus further expanded in the condensing turbine is condensed in a condenser and is thus liquified in giving up its latent heat to the cooling water or a heating wafer circle, in either case in the liquid condensate being brought to higher pressure by the condensate pump, now called feed water, and is heated by low pressure bled steam heaters to the higher temperature before it is fed to the deaerator for deaeration which serves also as a means for feed water storage and this deaerated feed water is pressurized by the feed pump to a specified high pressure and is further heated by bled steam from the condensing turbine in high pressure heaters characterized in that the fully cycle mass flows before being heated by external heat input are heated in a heat exchanger by heat exchange with the full cycle mass flows expanded in the high temperature steam turbine and flowing from the high temperature steam turbine to said heat exchanger where they are cooled, and that this part of the full cycle mass flows thus cooled in said heat exchanger which is not fed to the condensing turbine for further expansion, this other part is cooled by injection of feed water in an injection cooler, said feed water being pressurized by the feed pump and being feed heated by bled steam heater, said part of the full steam cycle mass flows being increased by the mass flow of the injected feed water is compressed in a steam compressor or a first stage group thereof, this steam compressor being driven by the high temperature steam turbine, after which a further injection and compression in a succeeding part of the steam compressor may follow, and that in consequence the full cycle mass flows being thus replenished and compressed are heated in the heat exchanger mentioned above.

Abstract (de)

Gemäß der vorliegenden Erfindung wird ein Dampfkreislauf mit hoher Temperatur der Wärmezufuhr geschaffen. Dies erfolgt in dem das medium Wasserdampf eine doppelte Schleife, ähnlich einer Ziffer 8 durchströmt, wobei gemäß Fig.1 und Anspruch 1 die äußere Wärme auf höchstem Temperaturniveau dem Dampf in der temperaturmäßig höher liegenden Schleife zugeführt wird und dieser nach der Expansion in der Hochtemperatur-Dampfturbine und damit der Kühlung im Wärmetauscher verzweigt wird, zum Teil der temperaturmäßig tiefer liegenden Schleife zur Entspannung in die Kondensationsturbine zugeleitet wird, und nach Kondensation und Anzapfvorwärmung als Einspritz-Speisewasser in den anderen Zweig des Dampfstromes zur Kühlung vor dem Eintritt in den Kompressor eingespritzt und damit der Hochtemperaturschleife wieder zugeführt wird, womit nach Kompression und Aufwärmung im Dampfwärmetauscher mit dem Eintritt in den Dampferhitzer zur äußeren Wärmezufuhr die doppelte Schleife geschlossen wird. Neben hohem thermischen Wirkungsgrad der Wärmekraftanlage werden günstige strömungstechnische und festigkeitsmäßige Eigenschaften der Hochtemperatur-Dampfturbine erhalten.

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F01K 7/16; **F01K 19/02**

IPC 8 full level

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CPC (source: EP)

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