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The operational concept for Tricity metropolitan area district heating system supplied by first Polish nuclear power plant

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In this paper the idea of the cooperation between Tricity district heating system and first Polish nuclear power plant is presented and discussed. NCHP (eng. Nuclear Combined Heat and Power) system, mainly due to the presence of the relatively large centres of population (Gdansk-Gdynia-Sopot area, Slupsk), seems to be applicable in the close vicinity of the forthcoming first nuclear power plant in Poland located in Pomerania region. However, when operated, it is vital to select economically and technically justified power demands and introduce, in a proper way, heat extraction from the heat loop.

To identify crucial aspects of the abovementioned NCHP initiative, simplified feasibility study was prepared. The possibilities of a heat extraction from the loop coupled with PWR-type reactor were presented. In order to identify the electric and heat power of a modified NPP, the correction coefficients of the electricity generation were calculated. Moreover, the future heat demand in the area of Tricity was assessed as well as the route of the main pipeline. Finally, to guarantee the high efficiency of the heat transport, thermal input of nuclear power plant was analysed. The environmental benefits (due to i.e. the replacement of a professional coal-fired CHP units in Gdansk and Gdynia) of the implementation of NCHP in Tricity region were indicated too.

All results were presented in a synthetic way and briefly commented.

Author: Mr CHOLEWINSKI, Maciej (Wroclaw University of Science and Technology, The Faculty of Mechanical and Power Engineering, The Chair of Energy Technologies, Turbines and Modelling of Thermal and Fluid Flow Processes)

Presenter: Mr CHOLEWINSKI, Maciej (Wroclaw University of Science and Technology, The Faculty of Mechanical and Power Engineering, The Chair of Energy Technologies, Turbines and Modelling of Thermal and Fluid Flow Processes)

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