Algorithm 2 Basic scheme for coupled NK-TH calculations (as to be implemented in the script)

■ **input:** s_1, b, $\vec{\rho}$
■ **declare:** $S \leftarrow 0$
■ **declare:** $\vec{P}$ (may be a zero vector)
for $i \leftarrow 1, 2, \ldots$ **do**
    ■ **declare:** $s \leftarrow (s_1 + \sqrt{s_1^2 + 4s_1 S})/2$
    ■ **declare:** $c \leftarrow integer(s/b)$
    ■ **declare:** $\vec{p} \leftarrow$ power distribution in a system with coolant density $\vec{\rho}$
        distribution based on MC crit. simulation with c active cycles
    ■ $S \leftarrow S + s$
    ■ **declare:** $\alpha = s/S$
    ■ $\vec{P} \leftarrow (1 - \alpha)\vec{P} + \alpha\vec{p}$
    ■ remormalize $\vec{P}$ so that the system gives required power
    ■ $\vec{\rho} \leftarrow$ calculation of the steady-state coolant density distribution
        based on power distribution $\vec{P}$
end for

Literature

1. Dufek, J. and Gudowski, W., "Stochastic Approximation for Monte Carlo Calculation of Steady-State Conditions in Thermal Reactors," *Nucl. Sci. Eng.*, Vol. 152, 2006, pp. 274.