

ORCs for LNG cold energy recovery – working fluid screening & process optimization

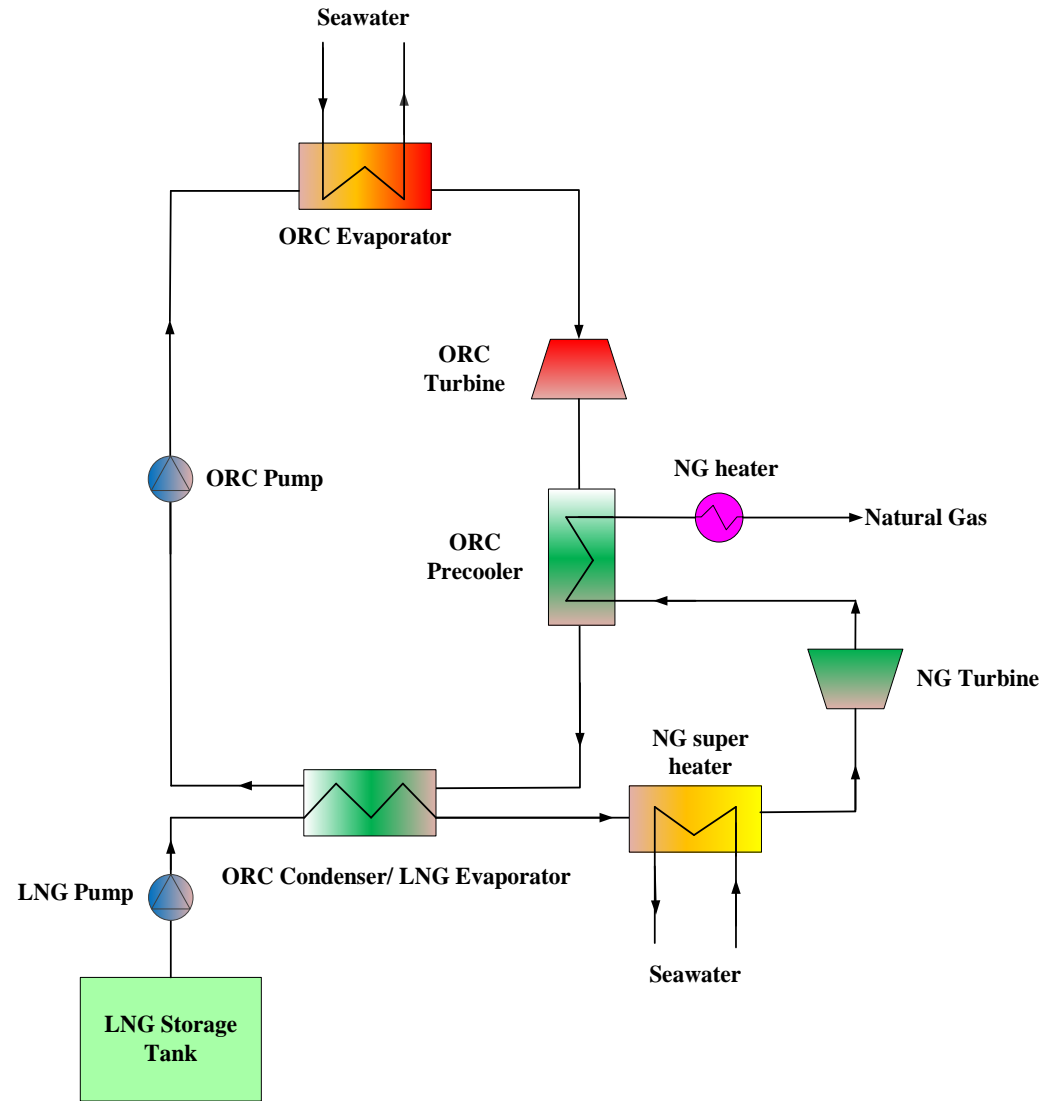
Motivation

A significant amount of cold energy in **LNG** is discarded without proper utilization at the LNG storage terminal. **Organic Rankine cycles** (ORCs) and natural gas **Direct Expansion** (DE) are popular power generation technologies to utilize LNG **cold energy**.

Challenges

- **Working fluid screening**
- **Optimal system configurations**
- **Optimization of operating conditions**
- **Techno-economic evaluation**

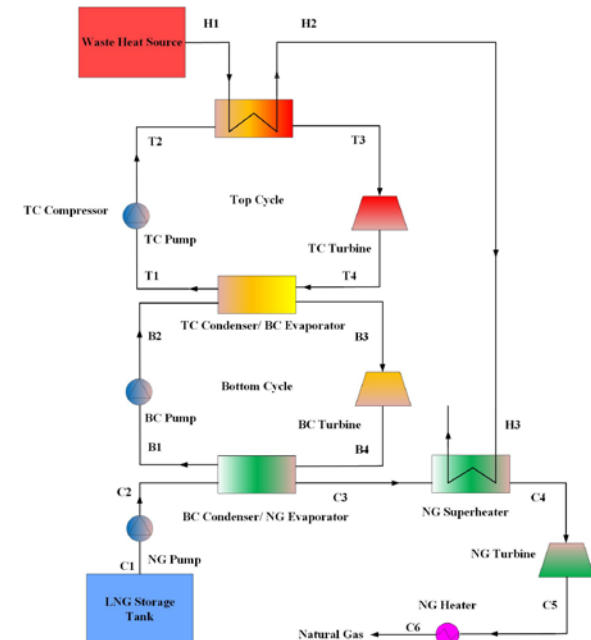
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Single-stage ORC to recover LNG cold energy

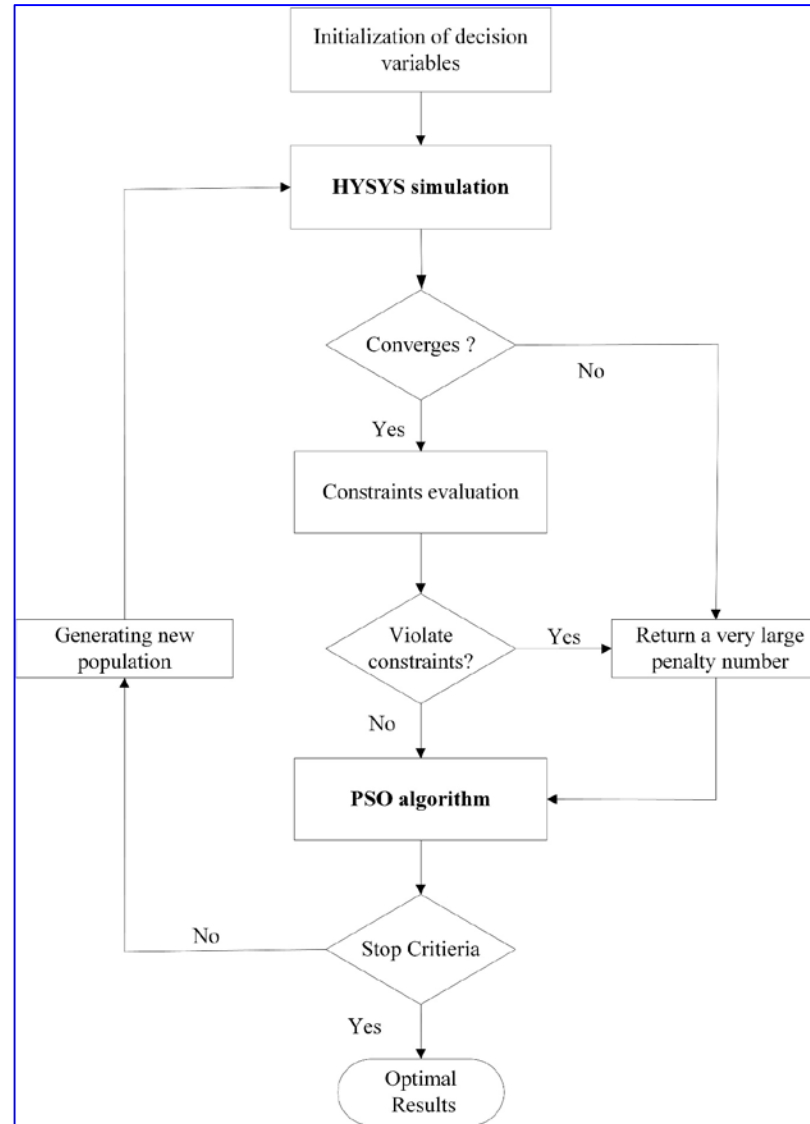
There are many configurations of ORCs

- Single-stage ORC
- Multi-stage ORCs
- Cascaded ORCs
- Parallel ORCs
- ...

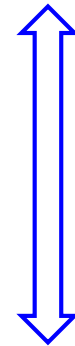


Cascaded ORCs

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Simulation
Aspen HYSYS



Optimization
Matlab-PSO

Simulation-based PSO
optimization framework