

Sodium draining facility and complete drainage of tanks

Design and installation of a sodium draining facility for mobile or fixed tanks.

These facilities can be used to completely drain tanks containing any grade of sodium. The sodium collected is decanted and then filtered in order to be massively treated in a continuous flow facility.

Challenge

Operating and dismantling a facility using sodium (or NaK) for the purposes of heat transfer creates many tanks which cannot be drained in full in the context of operations (a minimum level is maintained, settling area, limited risk of leakage). On this basis, it is necessary to install facilities able to drain these tanks as completely as possible, in the shortest possible period, while complying with the safety instructions applicable to sodium transfers.

Note: the risk of sodium leaks could be increased due to tank histories, with new connections which were not planned during manufacturing.

A dedicated facility can be installed for mobile tanks or specific lines can be created to completely drain fixed tanks.

Solution

The design of the draining facility and the drainage connections required on the tanks is compatible with:

- the most complete possible drainage of the tanks,
- filtering or settling the sodium to ensure compatibility with bulk treatment,
- compliance with the highest level of requirements in terms of sodium fires and leaks.

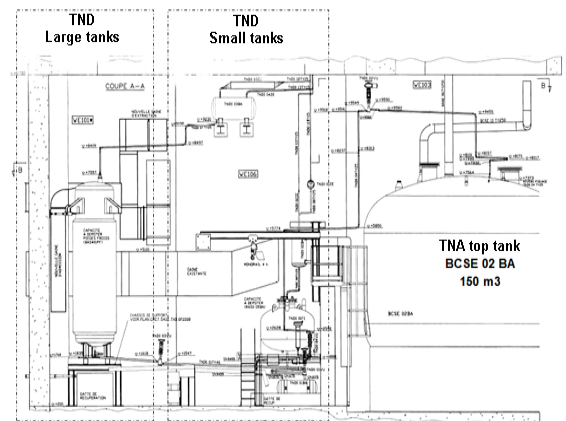


Inserting a tank in the TND draining facility

Customer benefits

The acquired experience guarantees:

- An optimal design to integrate the maximum possible efficiency of drainage, while meeting safety requirements.
- A controlled schedule.



TND draining facility

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Technical information

Thanks to the TND draining facility at SPX, sodium tanks were drained up to a maximum volume of 6 m³ at a flow rate of 2 m³/h. The system was studied from March 2004 to January 2006. Assembly began in April 2008 and the system was qualified on the basis of an initial sodium drainage operation in October 2009. Thanks to the design of the system, one tank was drained each month by creating the necessary connections for satisfactory drainage.

This system incorporates the risk of sodium fires and leaks with the use of a retention tray and jet deflector, sodium fire and leak detectors. Extinguishing devices such as MARCALINA powder or inert gas are also set up.

Other drainage operations were carried out locally for fixed tanks or for scheduling or containment reasons.



Connection welded to the base of a tank



Double wall pipe in room without leak retention



Internal view after complementary drainage of tank MAS0 01BA



Drainage line section connected to an electromagnetic pump



Drainage area in TND before fitting a tank.
View of the supports and retention trays

Key figures

TND draining facility of SPX:

17 drainage completed

40 m³ in sodium transferred to TNA

Draining facility in SGU building SPX:

4 cold traps RUR,

2 cold traps MAB

Draining facility in cell MIC SPX:

4 heat exchangers RUR (final drainage)

Draining of existing tanks SPX:

8 heat exchangers RCP (160 m³)

4 heat exchangers RUR and associated circuits

4 tanks BCS and 2 tanks RUR

3 tanks RAS

1 tank MAS0

1 tank of PTC

3 cold traps BAS (sodium and NaK)

References

EDF Creys-Malville reactor (Super-Phenix):

- TND draining facility
- Draining facility in cell MIC of reactor building
- Local draining in SGU building

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