

Reactor Loop's Parameters:

	Mass Flow kg/s	Hot C	Hot bar	Cold C	Cold Bar	Fluid numbers are mol fraction
Fuelsalt	2994	704	10.5	564	4.0	NaF-BeF ₂ -ThF ₄ -UF ₄ 76/12/9.5/2.5
Secondary Salt	1534	621	10.5	454	20.0	NaF-BeF ₂ 57/43
Tertiary Salt	1414	598	12.0	344	1.0	NaNO ₃ -KNO ₃ 55/45
Steam Main	225	538	248	288	260	
Steam Reheat	162	538	38	343	39	

The reactor will be coupled to the hydrogen production process by implementing two heat exchangers in the tertiary loop. One of the heat exchanger is the reactors heat transfer to the steam generator and the second heat exchanger will be the indirect connection from the reactor to the hydrogen process. The tertiary salt will transfer heat to a water loop in the hydrogen process. This water loop will carry the necessary heat for the whole hydrogen plant this way eliminating cost and increasing safety.

Safety and Licensing

Currently the US Department of Energy in collaboration with the National Renewable Energy Laboratory (and other organizations) have started a program entitled Hydrogen, Fuel Cells, and Infrastructure Technologies (HFCIT) which, among other tasks, are preparing reviewing and promulgate hydrogen codes and standards needed to expedite hydrogen infrastructure development including incorporation to nuclear reactor facilities. The next image is the overall structure of the program taken from “Nuclear Energy for Hydrogen Generation through Intermediate Heat Exchangers” by Bahman Zohuri:

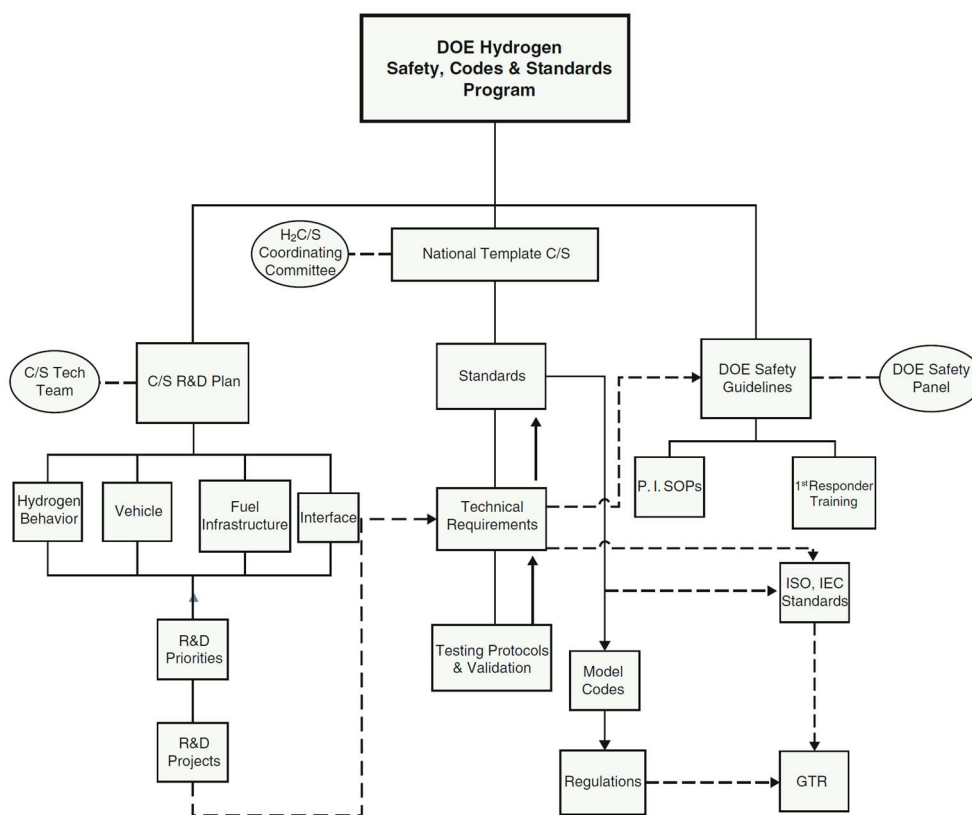


Fig. 3.28 DOE hydrogen safety, codes, and standards program [15]

Figure 1: Overview

Figure 2: Reactor Flow Diagram

Figure 3: Cu-Cl Hydrogen Production Flow Diagram