

Figure 8. The Fuel Battery for Project Gemini. A pictorial history of its development by the General Electric Company.

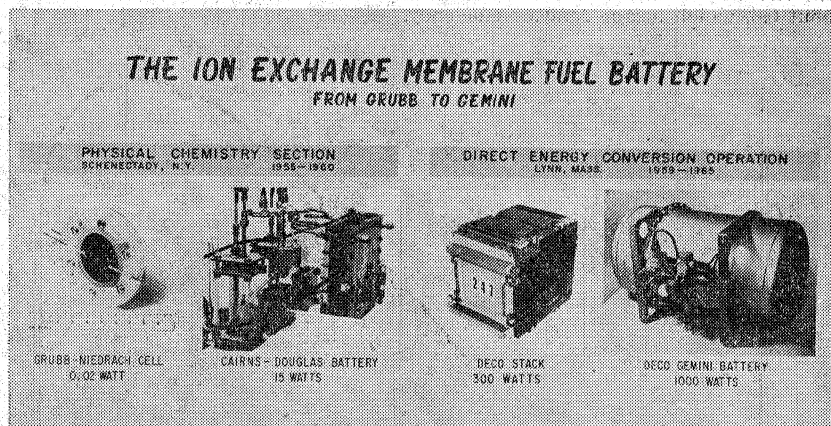


FIGURE 8

Question 2: What are your views on the problem of ultimate disposal of nuclear fuel wastes (after reprocessing) when nuclear-electric power becomes a dominant factor?

Answer: In a broad sense, this question has been the subject of considerable study, concern, and—in many cases—debate by nuclear industry professionals, State and Federal agencies, and other interested groups or individuals both domestically and worldwide for over two decades. During this time, high-level waste handling practices have evolved and sufficient operating experience has been accumulated to prove the applicability and, in general, the acceptability of these methods for radioactive waste storage on an interim basis, as contrasted to permanent or ultimate disposal.

Fission product wastes derived from solvent extraction separations plants (the current standard reprocessing method) are generally classified into four categories: high-, intermediate-, and low-level aqueous wastes, and gaseous wastes. The principal characteristics of these waste streams are as follows:

High-level wastes.—High-level waste is generally the waste raffinate from the first cycle of solvent extraction. This raffinate stream is acidic and contains 99.9-plus percent of all the fission products originally present in the spent nuclear fuel. The raffinate stream is normally concentrated by evaporation to yield a final waste solution of a few hundred gallons per ton of uranium processed. This final high-level waste solution is stored in either an acidic or alkaline form in underground tanks (either stainless steel or mild steel) with ancillary operating facilities and instrumentation to detect maloperation of the specific containment systems employed.

The water rejected from the waste concentration step above is contaminated with far lesser quantities of fission products than the original high-level wastes and is subsequently handled as an intermediate-level waste.