

1. 使用済燃料についての考え／印象 (Impression/thoughts on SF)

- 1) “Waste is a misplaced resource, existing at a wrong place at a wrong time.”
(Waste minimization and resource conservation, Bureau of Energy Efficiency, India)
- 2) サイクルによる持続的な発展可能性を求めるパラダイムの中で95%以上は資源として再利用可能な有用物質なので、使用済燃料を資源として考えるのは資源小国として合理的な選択
 - 95%は燃え残りのウラン(エネルギー資源)
 - 1%程度は中性子を吸収して生成した核分裂性物質(エネルギー資源)
 - 生成するPd, Ruなど白金族元素は有用な希少金属として利用可能との専門家意見(例えば、藤井 元東工大教授)も。白金族元素はガラス固化設備で不溶解残渣として

In the contemporary paradigm of recycle/reuse as much as possible to enable sustainable development, Spent Fuels from NPPs containing more than 95% reusable materials can be regarded as “resources”. Japan, as a resource-poor nation, has been of the view that “SF is “resources” for a long time and this is a reasonable selection.

SF consists of;

- 95% Uranium
- 1% Fissile material as converted from fertile (Uranium 238)
- Pt-group elements such as Pd and Ru could be used as rare metals (Prof. Fujii), whereas these are the key elements in troublesome undissolved residue in glass solidification system in the Rokkasho Reprocessing Plant (RRP).

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- 3) 再処理施設はIFR(on-site reprocessing施設を併設するIntegral Fast Reactor)でない限り、ある程度の規模を持った施設として建設運用されるので、発生量に対してある施設容量を定め、それを超える分は一時的に貯蔵するのは合理的なオプション

Reprocessing facilities, if they are not a part of Integral Fast Reactor having on-site reprocessing capability, are constructed with a certain CAPACITY considering the amount of produced SF. It is reasonable to define this capacity and store the surplus temporarily.

- 4) 以上の考えを背景として、「使用済燃料は、当面は、利用可能になる再処理能力の範囲で再処理を行うこととし、これを超えて発生するものは中間貯蔵」(原子力委員会原子力政策大綱:H17.10.11)

The framework of Nuclear Policy (2005 October 11) by the AEC, considering the above, states “Spent fuel will be reprocessed, within the available reprocessing capacity, for the time being, and the surplus volume exceeding the capacity will be stored intermediately.”

2. 使用済燃料貯蔵施設と地域との関係

Relationship between SF storage facilities and hosting local community

- 1) 使用済燃料を生む過程で生産されるエネルギーの受益者(エネルギー消費者)と発電施設や使用済燃料の貯蔵を受け入れる地域社会との間の利益の公平を図るのが電源三法交付金

A subsidy system (in place since the first Arab Oil Embargo to promote siting of power generation facilities replacing oil by collecting a special purpose tax from consumers of electricity from electric power companies) has its extension to benefit the local community hosting SF storage. The underlying concept is reducing inequity between the consumers (benefitting from the use of electricity) and residents of local community hosting nuclear facilities.

- 2) 一方、貯蔵は新たな物を生まない静的な設備であるから、貯蔵による財の生産や直接的な雇用(検査、セキュリティ、貯蔵管理)は限定的

Since storage facility is a passive facility not producing something, production of commodity and direct jobs related to the facility is limited.

2. 使用済燃料貯蔵施設と地域との関係

Relationship between SF storage facilities and hosting local community

- 3) 貯蔵を契機として「永続性のある関係」をつくるかどうかは、

- 貯蔵が一過性かどうか次第
- 貯蔵を契機に(例えば交付金を活用するなど)新たな産業創造があるか否か次第
- 2050年度頃までに順次3~6か所(5,000t規模/か所)での貯蔵が必要(核燃料サイクル政策についての中間取りまとめ:H16.11.12)となると、可能性ある関連産業創造として、貯蔵を行うキャスク製造設備設置も考えられる。そこでは、リサイクルの考えを活かして原子力施設からの除染後クリアランス基準を満足した金属を再利用して金属キャスクを製造することも候補。コンクリートキャスク製造も規格が定まれば将来の候補

If a long-term relationship can be build between the two would depend on;

- Length of storage period (temporarily or for extended operation by accepting new while discharging old, even though storage period is limited for each SF)
- Plan for local area vitalization for instance by the use of subsidy
- The Interim Evaluation Report on Fuel Cycle Policy by the AEC states that Japan may need 3-6 storage facilities (with a capacity of 5000 Ton each) by 2050. Considering this demand for storage casks, it may be an idea to install metal recycle facility by reusing metal from nuclear power plant components that has been declared as below the "Clearance level" set to enable reuse in a society free of constraints. Concrete cask, when fabrication standards are set, is another choice.



Metals Recycling Facility (MRF) in West Cumbria by Studsvik UK Limited : capacity 2000Ton/Year

3. 貯蔵期間 Terms of storage

- 1) 中間貯蔵は、再処理までの期間という有限期間を意味する
Interim storage implies limited term of storage.
- 2) 安全機能(遮蔽、未臨界確保、熱除去、閉じ込め)の長期確保に関して、加速試験を含めた確認がなされ、許認可で審査され、50-60年の安全確保は確認済
Verification/validation was done including accelerated tests and confirmed by the regulatory body with regards to the assurance of safety functions (shielding, sub-criticality, heat removal, and containment) for 50-60 years.
- 3) 米国規制委員会の最近の見解:発電プラント(運転期間60年)+運転停止後の貯蔵で120年は可能
Recent statement by the US Nuclear Regulatory Commission is SF can stored be safely for 120 years on site (60 years during/after operation at the NPP and 60 years after the NPP has terminated its operation).

4. 地元振興 Local Area Vitalization

- 2の答えと同じ
Same answer as in 2