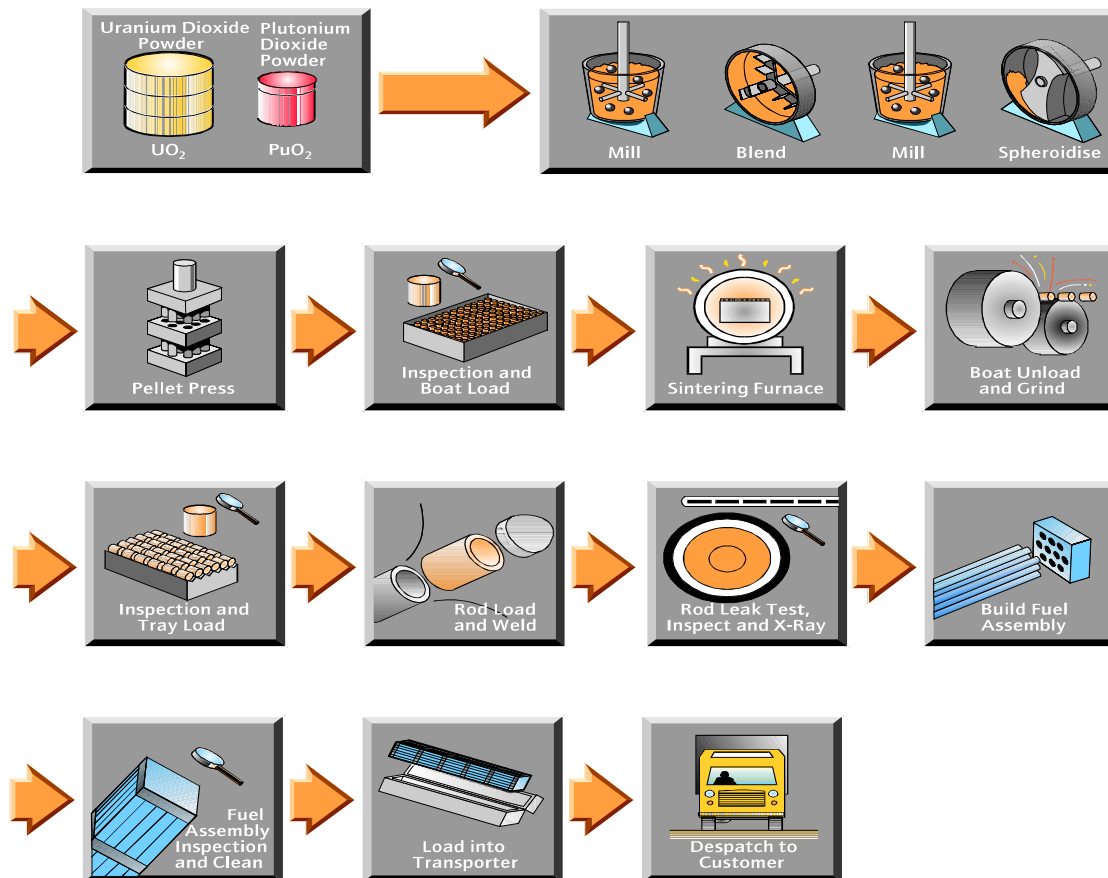


Sellafield MOX Plant



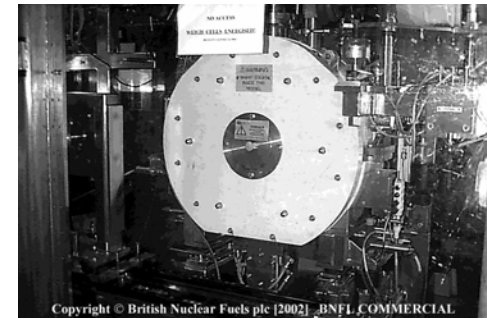
Process overview



patented
'Short Binderless
Route'
utilises high
energy milling and
results in a very
homogeneous
powder mix

Powder processing and pelletisation

- homogenisation
 - attritor mill and blender - mixes all in-feed powders
- conditioning
 - mill feed hopper - facilitates enrichment monitoring
 - attritor mill and spheroidiser - homogenises and granulates to produce free flowing press feed material
- pressing
 - hydraulic moving upper punches / die plate and fixed lower punches with 10 tool positions
- recycle



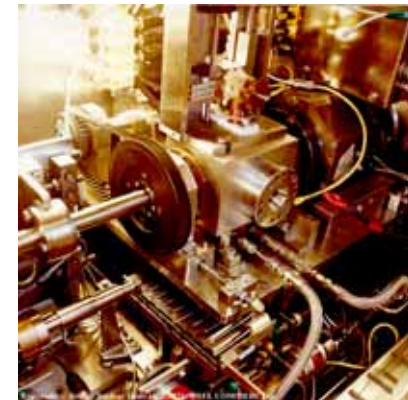
Pellet finishing

- sintering
 - continuous 3 zone furnace (pre-sinter, sinter and cooling) with inlet/outlet gloveboxes
- grinding
 - dry centreless grinder with dust extract to Torit filters
- inspection
 - laser micrometer (post grinder and pre CIS)
 - circumferential inspection system (CIS)
 - end inspection system (EIS)
 - flaw detection overcheck unit (FDOU)
 - sampling
- recycle / residue



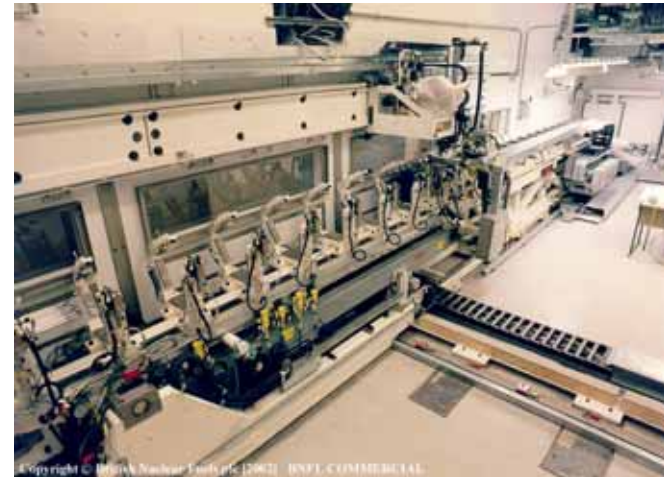
Rod fabrication and inspection

- pellet stacking
 - utilises grooved trays and manipulating equipment to ensure correct configuration for insertion into rod
- rod fabrication
 - carousel system which rotates fuel rods around seven Helium inert glovebox workstations
- inspection
 - safety – loose/fixed surface contamination; He leak
 - quality – rogue pellet detection; fuel rod geometry; x-ray; rod surface finish monitoring
- recycle



Fuel assembly and inspection

- skeleton receipt
- loading
 - PWR – row of rods pulled into skeleton
 - BWR – single rod pushed into skeleton
- nozzle fitting and blow cleaning
- inspection
 - geometric conformity and weight of complete fuel assembly
 - conformance of thimble tubes
 - final verification



Nuclear Material Accountancy & Safeguards

- Nuclear Material Custodians
- containment and surveillance
 - stores, seals and cameras
- continuous branching and logging of BNGSL equipment
- EURATOM installed equipment
 - data loggers, CCTV, monitors and ID readers
- MOX Plant Information Computer (MPIC)
- short and frequent inventory verification
- physical inventory verification (PIV)
- NRTMA
 - Plant Inventory Monitoring System (PIMS)



SMP environmental footprint

Negligible environmental impact from SMP operations -

- discharges
 - liquid - SMP process does not use liquids; majority of liquid effluents are floor washings
 - aerial - minimal discharges due to high quality filtration systems
- solid waste generation
 - LLW - trace contaminated wastes from plant areas PCM
 - PCM - from within gloveboxes
- energy use
 - ventilation systems (essential safety systems) and furnaces (essential process systems)
- recycling (MOX)
 - SMP process 'eats its tail'
 - small amount is not recyclable due to chemical impurities ('residue')