

# Reactor decommissioning: Berkeley



World winning solutions

◀ Aerial view of Berkeley power station with cooling water intake breakwater.

## Key project data

<b>Reactor type</b>	276 MWe twin magnox station.
<b>Initial operation</b>	1962.
<b>Decommissioning strategy</b>	Safestore.
<b>Timescales: 1988</b>	Reactor 2 shutdown.
<b>1989</b>	Reactor 1 shutdown. Defuelling began.
<b>1992</b>	84,890 fuel elements removed.
<b>1993</b>	Top gas circuits removed.
<b>1995</b>	Turbine hall demolition completed, reactor building lowered & heat exchangers lowered.
<b>1996</b>	Phase 1 pond facility decommissioning completed.
<b>1997-2000</b>	Phase 2 pond facility decontamination.
<b>2000-2001</b>	Demolition of cooling ponds facility.

Berkeley power station is the first commercial nuclear power station in the United Kingdom to be decommissioned. The station, located in Gloucestershire in the South West of England, had twin magnox reactors, with a combined output of 276 MWe. It was closed in 1989 following 27 years of successful operation.

The decommissioning of Berkeley power station has progressed successfully to programme and substantially under budget. It is currently undergoing final preparation for entering the care and maintenance phase.

Berkeley faced a unique decommissioning challenge, since the heat exchangers were external to the reactor building.

### Decommissioning strategy

The preferred decommissioning strategy for this site is Safestore, which essentially comprises three phases.

The first phase involves removal of the fuel from the site. This takes place within a few years of shutdown.

The second phase prepares the site for an extended period of Care and Maintenance. Preparations include retrieval and packaging of operational wastes, decontamination and dismantling of the fuel pond and construction of the Safestore. Most non-radioactive plant, including the turbine hall, is removed during these preparations. The Care and Maintenance phase takes advantage of radioactive decay.

At the end of the Care and Maintenance phase, the third phase, Site Clearance will take place. During Site Clearance, everything left on-site, including the reactors, will be dismantled.

### Performance highlights

Milestones completed to date:

- spent fuel removed and consigned for reprocessing. Fuel pond emptied and cleaned;
- majority of the conventional plant removed.
- boilers and main gas ducts extracted and stored;
- reactor sealed and reactor building structural alterations complete;
- turbine hall deplanted, demolished and returned to green field;
- decommissioning programme completed to schedule;
- defuelling completed two years ahead of schedule, leading to substantial cost savings;
- disposal of 24,000 tonnes of scrap for recycling;
- innovative decontamination techniques deployed.



▲ Decommissioning activities at Berkeley nuclear power station.

#### 1 UK Waste categories:

- **High-level wastes (heat generating):** Fission product concentrates
- **Intermediate-level wastes:** Fuel cladding, Low and medium active liquids, Slurries, Sludges, Flocs  
Low alpha technical wastes, High alpha technical wastes
- **Low-level wastes:** <12GBq/t beta gamma, <4GBq/t alpha.

### Future activities

- Decommissioning on target to enter Care and Maintenance by 2006.
- Currently commissioning new facilities for retrieval, processing and storage of intermediate-level<sup>1</sup> operational waste.

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